GAS JOURNAL

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HIGH PRESSURE HOLDERS

THE high pressure gasholder appears to have been introduced to Britain by Mr. George Helps. As far as we are aware, he it was who introduced the pressure distribution of gas to this country for the purpose, we believe, of high pressure street lighting. It is well that pioneers of new developments should receive their due meed of praise; it is generally about all they do receive. The pioneer too often makes the mistakes from which other people profit. It is therefore supremely creditable to the pioneer that he is sufficiently thick-skinned not to mind confessing to any mistake which he may have made in the course of his efforts to create an improvement. What this country needs to-day is more pioneers.

The high pressure gasholder has now become fairly firmly established, as was shown by Mr. G. M. Gill's Paper to the Institution of Gas Engineers last year. This type of holder has its specific place in gas-works economy and that place is almost always out on the district and is rarely within the gas-works. By many, pressure holders are not considered to be economic as the main storage, this no doubt being due to the fact that any gas that is to be stored at a high pressure must first be compressed. If the gas is not to be used in a compressed condition it is unnecessary, and therefore uneconomic, to expend the fuel required to produce the power needed for compression. High pressure holders lend themselves admirably, however, to reinforcing the gas pressure in remote parts of the distribution system where the mains are not sufficiently large to deal with peak loads. They can be filled up at night when the main is not overloaded and the gas so accumulated can be fed back into the main at times when the quantity that the main can pass is not large enough to supply the district. The high pressure gasholder used in this way is therefore fundamentally an extension of the gas main, having the same effect as an increase in diameter but without involving the cost of constructing a new or auxiliary main. Under these conditions the gas engineer must balance the cost of compression of whatever gas he finds it necessary to put through the pressure holder against the cost of a new main. If both these costs are worked out on the annual basis, including maintenance and depreciation and the cost of compression, it is possible to determine each cost on a basis of cost per therm of gas sold in that district and thereby arrive at an economic comparison.

Use as a Standby

A purely auxiliary method of using the high pressure holder is as a standby to replace a low pressure holder temporarily out of action. Mr. Gill has given some examples of how this has been done. To be economic it appears to be necessary to regard the high pressure holder and its compressor as standby plant which can be conveyed from place to place as required. Whether the practice will ever be introduced of a travelling high pressure holder we do not know. There is a travelling coke breeze briquetting machine, for example, which can travel from one works to another, spending a day or two at each works in order to briquette whatever breeze may have accumulated. Proposals have been made in the past, though we are not certain whether they have ever been put into practice, for a high pressure holder to be mounted on a lorry. The holder would be filled by the works compressor and its gas would be discharged, after conveyance some few miles to an outlying district, into a holder of sufficient capacity to supply a small village or hamlet. We can imagine a single unit enabling quite a number of hamlets to be supplied by gas in this way with the aid of a water sealed holder at the point of supply, and without the need of constructing several miles of gas main. Consideration of the economics of a proposal of this character would be interesting. It would entail drawing-up a balance of transport and compression costs at various compression pressures against the annual maintenance, depreciation, &c., cost of a gas main.

The interest that has been developed in the low pressure holder as an ancillary form of gas storage has been further emphasized in the Paper on the design of the high pressure holder by Messrs. M. Noone and A. G. Grant at the Institution meeting in June. There are problems of design in high pressure holders which, because new, are less near to solution than those of the low pressure holder. Moreover large high pressure holders give rise to more complex problems than the smaller vessels. Engineering insurance companies, as Mr. Gill pointed out, are critical of large welded storage vessels for use at high pressures. It is not by any means a simple matter to inspect welded joints on site and there is doubt whether X-ray methods, always very expensive, are a sufficient guarantee of the soundness of the joints. As a consequence some insurance companies do not allow as high a joint efficiency with welded as with riveted joints, so that thicker plates must be used, entailing more expensive construction. The testing of these holders provides problems of some difficulty. Mr. Gill's advice is that since vessels great in length and of small diameter have considerable engineering advantages over those which are small in length and large in diameter, the first choice should be the installation of a number of small vessels rather than one large vessel. These problems came up for debate in the 1947 Institution discussion on the subject.

Practice in Switzerland

The practice in this country, as we have said, is to regard pressure holders as suitable for outlying districts but not for works storage. In Switzerland, however, this is by no means always the practice. Colonel Zollikofer has explained

that in 1946, out of 77 pressure holders in operation in Switzerland, 38 were at gas-works and 39 at distant automatic stations. It would have been interesting if he had explained why so many pressure holders are there installed at gas-works. One may imagine that there is more pressure distribution in Switzerland than in this country, so that storage under pressure may be cheaper than installing larger compressors. The foundations are, of course, less expensive than for water-sealed holders, the maintenance cost is low, though it is not at all certain that it is lower than for the water-sealed holder. It is not necessary to apply heat to the holders in cold weather, and this may perhaps be a major factor in a country such as Switzerland. The fact that the high pressure holder can be used as an oil storage tank when it is not required for gas must also be taken into account, since by installing a high pressure holder one secures a duel-purpose vessel. The pressure gasholder, moreover, is inconspicuous—an outstanding advantage in a country like Switzerland which depends upon its natural beauty to attract the tourist. The experience of such a country as Switzerland is not necessarily a guide for an industrialized country such as Great Britain. Any review of the international fuel situation will show that the practice of any particular country must depend upon the local conditions reigning in that country; what is good for one country is not necessarily good for another.

Size and Testing

The conclusion reached by Mr. Gill that a number of small holders makes for a better engineering job than one large holder was fully borne out by Mr. Birks, who believes that the best practice may well be to build a small holder in the shops and to convey it on site in one piece, the size of the holder then being limited by conditions of transport. It may well be that the cost and the amount of metal entailed will not be very different per thousand cubic feet of gas storage whether there is a single large holder or a battery of small holders. Foundations and structural work may cost somewhat more for a battery of small holders, but other advantages may be sufficient to over-ride this. On the other hand there are large pressure holders of the cylindrical type being built to-day in this country up to 200 ft. in length and 32 ft. in diameter. A large pressure holder has lately been installed at Birmingham, so that opinion is evidently divided upon the optimum size for these vessels.

The testing of pressure holders is another subject upon which there is difference of opinion. It is possible to test the tightness of the holder after construction either hydraulically or by air tests. If the hydraulic test is used the foundations must be made sufficiently strong to carry the considerable weight of water entailed. The truth of the matter appears to be that a welded holder must be tested hydraulically, since a dangerous explosion might occur if the welding did not prove to be sufficiently strong to withstand air pressure. A welded holder must therefore have the heavier foundations required for this type of test. The riveted holder, however, is considered by most constructional firms as being entirely safe for air testing, since if a few rivets happen to be unsound the resulting split stops at the first sound rivet and no explosion occurs. Steam boilers are used of considerable diameter and for pressures higher than those at which gas storage vessels are operated with satisfactory results when under steam pressure. Boiler accidents are rare. The method of test and this limitation of testing has quite an important bearing on the construction of the vessel.

Riveting v. Welding

The debate on the construction of the high pressure holder brings forward once again the controversy between riveting and welding. Only time (or the untimely end of the disputants) will solve the problem of whether to weld or to rivet. There is so much to be said on both sides, and it has been said already, with much vigour and forthright language, that the time has come to put the issue to practical test. Unfortunately practical test must take many years. There are metaphorically centuries of riveting, but only a few short years of welding. In those few short years there have been examples of the failure of welded constructions; that is natural, since welding is relatively a new art. Methods of testing riveted vessels are known and experience has shown how to ensure that a riveted vessel shall be satisfactory. It may be that not on every occasion are the necessary precautions taken, and there has been experience of leaking at rivets. But by and large, riveting is known from years of experience to be a sound method of construction.

Welding is less certain. Not without reason do the protagonists of riveting ask by what means welded joints can be proved to be sound. Mr. A. H. Goodyer, of the National Boiler and General Insurance Company, was reported as saying at the Birmingham meeting, "fortunately only a few welded gasholders have failed in this country." It would have been exceedingly helpful if he had said which these holders were and what were the causes of the failure. Welding introduces more of the personal equation than riveting; that is commonly accepted. Since that is so, it is elementary commensense that welding must be tested until there are better techniques available by which testing can be eliminated. We had also understood that X-ray methods were the only accepted test; the X-ray method is used for Lloyds Class A vessels. But Mr. Hollis, the supreme advocate of welding ("I consider riveted gasholders whether for high or low pressure out of date") regards X-ray testing on site as very expensive and by no means infallible. It does not necessarily show up cracks; it will show up slag inclusions, which he considers to be of minor importance. And, "definitely X-ray examination will not reveal whether the welds contain residual stresses or not." For these reasons he considers the hammer test to be more essential than the X-ray test. As against this, Mr. Goodyer says that the hammer test has been abandoned in America "for the reason apparently that the hammer test itself starts a failure of a brittle nature in a welded holder which has the characteristic of unsuitable material internally or tri-axially stressed notches. There seems," he says, "to be a dangerous condition set up by hammer testing during hydraulic testing but personally I should hammer-test lightly, without indenting during the hydraulic test." Mr. Hollis considers that X-ray examination of a holder erected on site is unnecessary and that the hammer test should be applied as the sole test. When experts differ, who can say what is good practice?

The Fundamental Consideration

In view of the expense entailed in X-ray examination and of the apparent uncertainty of the test, it may well be asked: Why use welding for pressure holders until there is more security of getting an undeniably sound vessel? This doubt is emphasized by the practice of holder manufacturers in testing riveted vessels by air pressure, but in insisting that hydraulic testing, with consequently stronger and more expensive foundations, should be used for welded holders. The answer given by the authors of the Paper is that skilled hand riveters are not to be secured since the work is heavy and modern youth dislikes labour. Therefore manufacturers are driven, may be against their desires, to weld pressure holders. There is no possible doubt that Messrs. Noone and Grant have published a first-class investigation into the design of these holders. But their case that welding is necessary because there are no hand-riveters must be regarded as "not proven." Mr. Milbourne evidently has no difficulty in that respect, nor, we understand, have a number of other gasholder builders. The Gas Industry, as it seems to us, is still free to select welding or riveting for its pressure holders on technical grounds and without reference to the availability of labour. What its decision will be we do

not propose to guess. High authorities are ranged on opposite sides of the argument. One thing we shall support which ever way the decision goes. It is Mr. Birks's declaration that in the manufacture of gas-works plant, the highest standard must always be maintained irrespective of cost. From the contractor's side comes the answering declaration by Messrs. Noone and Grant: "No consideration of first cost, storage economics or local circumstances should be allowed to obscure the necessity for the highest standards in design and construction."

Commentary by "Abaris"

Selected Women

The Electrical Industry, when nationalized, will have the services of selected women, willy-nilly, on its committees, or whatever they call them, in the new scheme. It has been made almost crystal-clear that these women will be chosen, possibly, from the lower income groups, to use the current euphemistic title. They, it is darkly hinted, will take their work seriously; not like the dilettante from the middle and upper classes who to-day decorate so many committees in every county, borough, city, town, village, and hamlet. Idle tongues say this. What concerns us, is that we shall get the same pattern if and when the red light appears and the red tape is brought out to be wound about our necks. The leading lights in the Industry will have difficulty, no doubt, in settling down in that heterosexual atmosphere.

In gas, however, the women will have the almost impossible task of trying to absorb the chemical side, unless, as I suspect, they will try to manage only the sales and commercial side of selling. Their views may be acceptable in design, prices, and tariffs. They will probably turn the Homecraft personnel upside-down, and in general behave like new brooms; they may even raise some dust. Who can guess?

I do not for one moment decry women anywhere, for they can do an immense amount of good; but on committees they are apt to be, mildly, a little long-winded. Women, asses, and nuts, says an Italian proverb, require strong hands to break them. Yes, I shall watch the electrical women with a lack-lustre eye.

No Feminine Figurehead

While on the subject of women, I should like to continue by saying that when you stop to think about it, it is curious that there is no woman leader in the Gas Industry. There is no-one who plays anything like the part of the electrical Miss Caroline Haslett, for example, though we, as an industry, were established many years before the electricity supplying industry.

There must, as in all things, be an explanation for this, and I suggest in veritable humility that it was, and is, because gas does not attract women and because the Industry gives them very limited encouragement. We lack glamour despite our domestic virtues; we are conservative, and I mean this not in the political sense. Our domestic load is enormous and the women in this country subscribe heavily towards our healthy revenues. They decide what fuels they want in their kitchens and living rooms; and it is on these decisions that our dividends are paid.

Yet we do not admit women to employment in high places; we continue to allow mere males to tell females what to do and how to do it.

Which thought leads me to the Women's Gas Council, an admirable body that works unstintingly, with, be it added, very few laurels up to the present. There is perhaps one doubt about the Council, which applies equally to the E.A.W., and the doubt is connected with politics and power. The branches might become political and the Council itself might become so powerful as to dictate to the Industry. Both, I think, would be undesirable; and I leave it at that.

Surface Dressing

A wag once remarked that there are only two kinds of pedestrian on our roads, the quick and the dead. This I regard as hyperbole of the first magnitude, for I only encounter the quick and the slow; sometimes the slow are so slow that one day their heirs and assigns must collect the insurance money.

Which dismal thought leads me to tar and surface dressing, which at this time of the year goes on apace, and lends its good, healthy aroma to many a neighbourhood. I gaze fascinated at the tanks of tar as they lumber along, with never a sign that they contain refined tar for British roads, from British coal. People are all too conscious of the fact that it is tar, when it is being sprayed on roads; but they are quite unconscious of the greater fact that the stuff comes from the gas-works. It is not generally realized that tar gave really dustless roads and safer surfaces. Anyone who explored the countryside as late as 1914 will testify as to the terrific clouds of dust created by the road-hog with his new-fangled automobile. Tar laid that dust low.

Thousands of miles of roads are treated annually, but there is never a sign to connect the operation with gas and the coking industry. Our competitors must smile at our modesty; but we are certainly missing an opportunity of putting over another telling, though minor, story.

The Penny Past

What do you consider the most important development in the Gas Industry since 1812? This sounds rather like a question in an Institution Paper, but I shall supply you with the answer so that you may quarrel with me to your heart's content. I say the slot meter; or do you visualize something highly technical and abstruse? The slot meter came into use in 1889, in Ramsgate of all places, if my information is correct, and immediately brought the pay-as-you-burn system into popular use. It assured the weekly wage-earner of a simple and straightforward means of buying his light, and it allowed gas companies fewer bad debts and more consumers. True, some dishonest gentlemen opened up a few meters and stole the contents, but any reform or innovation will bring in its train a handful of wrecks. Anyway, the bugbear of quarterly accounts was, in many cases, swept away and business was given an additional impetus.

To-day slot meter consumers form more than two-thirds of the total, and though there is trouble in collecting the coppers, and the shillings—the value of the penny being so small—there is little trouble in collecting the shillings. Many of the well-to-do have slot meters because it saves the bother of waiting for an account; and the not-so-well-to-do revel in the rebate when the collector calls at their homes. So, you see, there is a case for the avid little slot meter, after all.

Tail Piece

The Two Owls

(With apologies and thanks to Æsop.)

A wise and prudent gas leader once related this fable to his master, the Minister of Fuel and Power:

There is an owl in El-Grosvenr, and an owl in El-Whitall.

Said the owl of El-Grosvenr to the other one day: "Give me thy daughter in marriage to my son."

Quoth the owl of El-Whitall, "I consent on condition that thou givest me as her dowry a hundred ruined industries."

Said the owl of El-Grosvenr, "That I cannot do now, but if Allah spare the Minister of Fuel and Power another year, I will do all thou requirest!"

Letter to the Editor

Correct Procedure

DEAR SIR,—"Stickler's" article on the correct procedure of address is opportune, for many examples of incorrect address have been seen within the past 20 years. The writer has been an esquire according to his driving licence issued by one county, and "Mr." the next year when resident in a different county. The gas company in one locality addressed him as "Mr.," while to the electricity company he was an esquire. As usual, the gas company was the more precise.

"Stickler" is not truly correct in his assertion that esquire was originally used only to describe a gentleman entitled to bear arms—it was rather at first an office of apprenticeship through which classes of nobility had to pass. It is now, strictly speaking, confined to the eldest sons of baronets and knights, the youngest sons of peers, and to certain officials as a mark of their position (such as sheriffs and mayors in office, and J.P.'s). The title seems to have been given by courtesy to Bachelors of Divinity, Law and Physics, whence possibly it became a commonplace title of any graduate or professional man.

Yours faithfully,

ARMIGER.

July 30, 1947.

Diary

Sept. 8.—London and Counties Coke Association: Technical Committee, Gas Industry House, 2.30 p.m.

Sept. 9.—British Gas Council: Central Board, Gas Industry House, 2.30 p.m.

Sept. 11.—North British Association of Gas Managers: Annual General Meeting, Town Hall, St. Andrews. (Golf and bowling competitions, Sept. 10; annual excursion, Pitlochry, Sept. 12).

News in Brief

Darlington Corporation has applied for sanction to borrow £17,500 for prospective expenditure on gas meters and appliances during the present year.

Stockton-on-Tees Corporation has accepted the tender of the Power Gas Corporation for the supply, delivery and erection of a second carburetted water gas plant for the gas-works. The foundation work, &c., will be carried out by the Corporation by direct labour.

A Party of Forty Members of Bolton Town Council visited the Corporation gas-works at Blackpool on July 23 under working conditions. Bolton contemplate erecting new works on an out-of-town site and before completing their plans they desired to see Blackpool's station.

The Ministry of Fuel and Power has approved of the laying of an 8 in. high pressure main between the gas-works of the Loughborough Corporation and Shepshed Urban District. The main is to be laid via the village of Hathern and a bulk supply of an agreed daily quantity will be provided. This will, for the time being, augment the production at the Shepshed Works, and the quantity will be increased as surplus gas becomes available from the Loughborough works.

Dublin's Gas Supply has been increased from eight to ten hours a day. Service continues without interruption from 6.30 a.m. to 2 p.m. and from 5.30 p.m. to 8 p.m. The new hours exceed by half an hour the number of gas hours which were available before the fuel crisis, but do not yet restore the 9.30 p.m. to 10.30 p.m. supply which was then available. The Alliance and Dublin Consumers' Gas Company, announcing the increase, stated that the continuance of the alteration would be possible only if no material increase in consumption resulted.

The Board of Trade has been informed that as the result of improved facilities in Germany it will be possible for an increased number of business men to visit the joint U.K.-U.S. Zones of Germany to buy goods and services. In future all applications to visit these zones should be sent to the German Division, Board of Trade, I.C. House, Millbank, London, S.W.1, giving full details of the proposed transaction and itinerary. Trading with Germany is subject to the normal import licensing and exchange control regulations. Business men who wish to sign contracts in Germany are therefore advised to make sure before departure that the necessary import licences will be forthcoming.

The Lakes (Ambleside) Urban District Council has received sanction from the Ministry of Fuel and Power to increase the capacity of its No. 3 holder to 100,000 cu.ft. by adding a new outer lift, and to install a vertical water tube condenser of 250,000 cu.ft. per day capacity. The necessity for this work is due to the greatly increased demand for gas. Gas sales for the year ended Mar. 31, 1939, were 22,572,500 cu.ft., and for the year ended Mar. 31, 1947, 42,427,900 cu.ft., an increase of 87.9%. The carbonizing plant was completely modernized and rebuilt by Drakes, Ltd., in 1937-38. The sale of gas is 101.2% higher than in 1937, when the Council was advised by its Engineer and Manager, Mr. W. N. Battersby, to rebuild and enlarge the carbonizing capacity, although it was never anticipated that the demand would be doubled in 10 years, especially as there is no industrial load. In spite of heavy increases in the cost of labour and coal, gas is still sold at a profit at its pre-war price of 1s. per therm (with graded discounts up to 20%). Boosting plant was installed in 1941, and adequate pressures have been maintained under all circumstances, no pressure reduction having been made until the recent demand for economy.

Blackpool's Gas Engineer, Mr. T. R. Cook, hopes to light over 5,000 of Blackpool's 6,500 gas lamps, even with the 50% cut. Staggered lighting is not likely to be adopted and saving will be effected by the use of smaller lights.

An Extraordinary General Meeting of the proprietors of Grantham Gas Company has authorized the Directors to raise further capital by the issue of £34,500 redeemable consolidated preference stock to provide for the present and future development of the company.

A Most Satisfactory Year's Trading was revealed at the annual general meeting of Midland Brass Fittings Co., Ltd., held at the Company's registered office in Birmingham on July 23. In spite of the ever present difficulties both in distribution and supply the business of the Company continues to expand. The report and accounts were adopted and the retiring Directors re-elected.

We Have Received from the publishers, Stevens and Sons, Ltd., a book written by T. A. Blanco White, Barrister-at-Law, entitled "Patents and Registered Designs and their Exploitation." This book discusses the law of patents, the law of artistic copyright, and the law of industrial business, and should prove of great interest and usefulness to business men and manufacturers. The price of the work is 4s. net and it is obtainable from the publishers at 119, Chancery Lane W.C.2.

The Eire Labour Court has recommended that the Alliance Dublin Consumers' Gas Company pay all workers in a particular group the appropriate district rate of wages, with the appropriate "house money" or "maintenance rate" and should give to all at present employed the benefit of the special Company conditions which some now enjoy. The recommendation follows a dispute between the Irish Seamen and Port Workers' Union, the Workers' Union of Ireland, and the Company. Dealing with the strike of May 16 and May 21 the statement adds: "Their undisciplined and irresponsible conduct was a violation of the principles of sound trade union organization and was a direct menace to the welfare of many thousands of their fellow-workers and the public generally."

"Apparent Inconsistency" of wage re-gradings by the Lancashire and Cheshire Appeals Committee resulted in a deferment of their acceptance by the Accrington and District Gas and Water Board on July 2. The gradings followed appeals by 12 employees against the Board's original ruling. Six were disallowed by the tribunal. Alderman Roberts said what the tribunal seemed to have done was to put 12 names into a hat and upgraded the first six out. A man with 10 years' service was put into a higher grade while others with 40 and 36 years' service were not, although their work was similar. It caused staff dissatisfaction. The manager (Mr. A. Harrison) said the original grading was considered in 1946. The tribunal gave their decision without reasons. The decision had caused difficulties and trouble. Two men were doing the same work, yet one got considerably less than the other. He felt the tribunal had not sufficient knowledge to individualize. "If the decision had been drawn from a hat it could not have been worse," said Councillor Dawson. The Chairman said the Committee felt there was no other course open than to accept the tribunal's decision. The Clerk said the tribunal were the final arbitrators. If they put the six men in the clerical division the successful six could make a further appeal to the tribunal for upgrading. The matter was referred to the Committee.

INTENSIVE COURSE AT BRADFORD

It is proposed, subject to there being sufficient applicants, to commence another of the Intensive Courses arranged by the Gas Education Committee of the Institution of Gas Engineers and recognized by the Ministry of Labour and National Service for the purpose of awards under the Government's Further Education and Training Scheme at the Bradford Technical College, on Sept. 29. It is intended primarily for candidates who have obtained the Ordinary Grade Certificate in Gas Engineering (Supply), but candidates who have reached a standard approximating closely thereto may be admitted, subject to the approval of the Gas Education Committee of the Institution, and of the Principal of the College.

The Course will have the following time-table: Sept. 29-Dec. 19, Jan. 12-Mar. 20, April 5-May 28. At the conclusion of the course students will be required to pass examinations in ancillary subjects set by the College and in the main subject of Gas Engineering (Supply) set by the Board of Examiners of the Instution.

Intending participants should make application without delay to the Principal of the Bradford Technical College, Mr. H. Richardson, M.Sc.

1947 "JOURNAL" DIRECTORY

In order to keep the Directory information up to date, the following alterations and corrections which have been notified during the past month should be noted in the 1947 issue of the "JOURNAL" Calendar and Directory:

Page 28. EASTBOURNE GAS COMPANY. C. J. B. Sawbridge, *G.M.*, vice S. E. Knowles, retired.
" 68. SOUTH SUBURBAN GAS COMPANY. V. Simmonds, *Works E.*, retired.
" 88. CARNOUSTIE GAS DEPARTMENT. J. McPherson, *E. and M.*, vice J. M. Ireland, retired.
" 92. KILWINNING GAS DEPARTMENT. D. M. Rowan, *E. and M.*
" 96. PERTH GAS DEPARTMENT. R. H. Foston, *Dep. E. and M.*
" 128. SEVERN VALLEY GAS CORPORATION. Major Julian Day, M.C., *Ch.*, deceased.
" 129. SOUTH EASTERN GAS CORPORATION. Major Julian Day, M.C., *Director*, deceased.
" 130. SOUTH WESTERN GAS AND WATER CORPORATION. B. Ottley, *Ch.*, deceased.
" 131. UNITED KINGDOM GAS CORPORATION. B. Ottley, *Ch.*, deceased.

NORTH WALES DISTRICT TAR BOARD

THE North Wales District Tar Board of the British Road Tar Association held a meeting at the Golf Club Hotel, Prestatyn, on June 24. Opportunity was taken to inspect the mobile laboratory of the Midland Tar Distillers, a number of surveyors being present, and after lunch a golf competition took place on the adjoining links. Mr. J. H. Noble, Engineer and Manager of the Chester United Gas Company and the Chairman of the District Tar Board, presided.

After the formal business Mr. W. E. Cone, Technical Adviser of the B.R.T.A., gave a resume of the activities of the Association. He referred briefly to the work of the Road Tar Research Committee and of the Technical and Propaganda Committee of the Association. With regard to propaganda, he mentioned that nearly 10,000 copies of the Tarway Code had been distributed, and that it had been found a most useful code for users of road tar. The Association had also published two leaflets designed to assist road tar suppliers in stimulating their sales of road tar. These had been well received, and free copies were still available. The Committee was also very active in propaganda in many directions. Lantern slides on tar surface dressing had been prepared, and sets were available for showing to the staffs of surveyors throughout the country. Local road tar suppliers and the B.R.T.A. headquarters would be pleased to arrange for the slides to be displayed in any district. The Association was also engaged jointly with the Department of Scientific and Industrial Research in the preparation of a film on tar surface dressing which will show the right and wrong way of conducting this operation, and it was hoped that the film would be available in a few months.

Work of the Technical Committee

Mr. Cone referred to the work of the Technical Committee which had been set up by the Association in order to form a liaison between the Research Committee and the members of the Association so that the results of research undertaken by the Road Research Laboratory could be translated into practical effect. The Technical Committee was at present engaged on the preparation of a Code of Practice for Tar Surface Dressing which would embody all known forms, and a report was also being prepared on the subject of tar carpets.

The Road Tar Research Committee is a joint Committee on which sit representatives of the B.R.T.A., the Road Research Laboratory, the Ministry of Transport, and highway authorities. It is not only concerned with the results of laboratory work on fundamental and applied research in relation to road tar, but it also arranges road trials covering all aspects of its use.

Close liaison was maintained between the Association, the Ministry of Transport, and kindred organizations. The B.R.T.A. was represented on the Federation of Coated Macadam Industries, and Mr. Cone said that it was hoped arrangements would shortly be made for practical trials with a view to specification being prepared for fine graded tarmacadam.

Mr. Cone also mentioned the Certification Trade Mark which was operated jointly by the British Standards Institution and the B.R.T.A. Considerable interest had been shown by surveyors, and a large number of road tar suppliers now held the licence to manufacture certificated road tar.

After the meeting the members were joined by a number of surveyors and the mobile laboratory was inspected. Mr. Brendan Robinson, on behalf of the Midland Tar Distillers, said that the laboratory was designed to assist in the investigation of practical problems of manufacture at the quarry and of laying on the road. He hoped that surveyors and quarry owners would make the utmost use of the laboratory for the mutual advantage of both supplier and user.

The inspection was followed by lunch at which the chair was taken by Mr. J. H. Noble, and among those present were Mr. J. Ellis Evans, Chairman of the Prestatyn Urban District Council, Mr. Stanley Robinson, Chairman of the Midland Tar Distillers, Ltd., and a number of County and Borough Surveyors. Mr. M. Spencer Rogers, County Surveyor for Anglesey, proposed the toast of the British Road Tar Association and the Midland Tar Distillers, Ltd.

Research Expenditure

In responding to the toast, Mr. Stanley Robinson welcomed Mr. J. Ellis Evans and also Mr. Pennant Williams, Chairman of the Gas Committee of the Prestatyn Urban District Council. He recalled that the B.R.T.A. had been brought into being over 21 years ago as the result of steps which had initially been taken by his own Company, and said that the Association spent £5,000 a year on research and that this amount was doubled by the contribution from the Department of Scientific and Industrial Research. In addition his own Company, in common with several others, spent many thousands of pounds annually in research. He said that there was every reason to make the utmost use of road tar as it was obtained from an indigenous product of this country. He hoped, therefore, that everything possible would be done to increase the quality of road tar and to make the utmost use of it.

Mr. W. E. Cone stressed the need for a full understanding of the practical problems of highway engineers, and was glad to know that surveyors were so ready to discuss them. He referred to the cuts in the grants for road expenditure and said that negotiations were at present proceeding between the Divisional Road Engineers of the Ministry of Transport and local authorities which might result in further expenditure being allowed to rank for grant.

Mr. A. W. Smith, a Vice-President of the B.R.T.A., proposed a vote of thanks to Mr. Noble for his occupancy of the chair, and expressed appreciation of the services rendered for so many years by Mr. H. Blythe as Secretary of the North Wales District Tar Board.

The day concluded with the annual golf competition. The cup, which was presented by the Midland Tar Distillers, was won this year by Mr. J. H. Noble, Chairman of the District Tar Board.

INTERNATIONAL GAS UNION

By invitation of the Belgian Association of Gas Engineers a meeting of the Council of the International Gas Union was held on May 6 and 7 in Brussels, under the chairmanship of Colonel C. M. Croft (President). The following member organizations were represented:

Great Britain: The Institution of Gas Engineers: Colonel C. M. Croft, President, International Gas Union, Past President, Institution of Gas Engineers. Dr. W. T. K. Braunholtz (Secretary) Secretary to the President of the International Gas Union. Colonel H. D. Greenwood, Controller (Gas) of the Fuel, Power, and Public Utilities Branch of the Control Commission for Germany (British Element).

Belgium: Belgian Association of Gas Engineers: Mr. V. Timmermans (President), Vice-President of the International Gas Union. Mr. R. H. Touwaide (General Secretary).

France: Technical Association of the Gas Industry in France: Mr. A. Baril, Past President of the International Gas Union. Mr. P. Mougin, representing "Electricité de France," former General Secretary of the International Gas Union. Mr. F. Prégermain (Vice-President).

Netherlands: Netherlands Gas Association: Professor G. A. Brender à Brandis, Vice-President of the International Gas Union. Mr. C. L. Philips (President).

Sweden: Swedish Gas-works Association: Mr. C. W. Pilo (President), Vice-President of the International Gas Union.

Switzerland: Swiss Society of Gas and Water Engineers: Dr. Hs. Deringer (President). Colonel H. Zollikofer (General Secretary), General Secretary of the International Gas Union.

Czechoslovakia: Association of Gas, Water, and Sanitary Engineering: Dr. Th. Keclik (Secretary).

Mr. V. Timmermans, President of the Belgian Association of Gas Engineers, gave a cordial welcome, on behalf of the Association, to the members of the Council.

The list of members of the International Gas Union is as follows: American Gas Association, Association des Gaziers Belges, Canadian Gas Association, Association Technique de l'Industrie du Gaz en France, Institution of Gas Engineers, Vereeniging van Gasfabrikanten in Nederland, Svenska Gasverksföreningen, Plynarenski, Vodarenski a Zdravotne-Technicki Svaz CSL, Société Suisse de l'Industrie du Gaz et des Eaux.

Reports were presented by the delegates of Great Britain, Belgium, France, the Netherlands, and Sweden, and the Council adopted a resolution to be addressed to the World Power Conference.

The Council asked the following member organizations to prepare reports for the next International Gas Congress to be held in London in 1949: Institution of Gas Engineers, Association Technique de l'Industrie du Gaz en France, Svenska Gasverksföreningen, Association des Gaziers Belges.

Colonel C. M. Croft thanked the Belgian Association of Gas Engineers for their kind welcome to himself and to the delegates of the various countries, as well as for the arrangements for the meeting, including the banquet which was attended by His Excellency the Minister of Economic Affairs, Monsieur Duvieusart, by his Private Secretary, Monsieur Charles Roger, by the Secretary-General of the Department, Baron Snoy et d'Oppuers, and by members of Committees of various organizations of the Gas Industry in Belgium.

The Chairman of the Bolton Gas Committee (Councillor Gradwell), describing the results of the winter on the Department, said that it was not their intention to spend more money than necessary on Gas Street and Lune Street plant because a new project would soon operate. He reported that since 1872 the undertaking has contributed over £672,000 in relief of rates. Last year 95,600 tons of coal was carbonized, producing 1,606,000,000 cu.ft. of gas—an amount 60% greater than pre-war.

GAS FROM THE PUBLIC WORKS ANGLE

IN HOME, INDUSTRY, AND COMMERCE

THE Institution of Gas Engineers was responsible for one of the 17 Conferences held at Olympia during the period of the Public Works, Roads, and Transport Exhibition and Congress (July 21-26). Dr. Harold Hartley, President of the Institution, presided, and two Papers were presented; one on "The Gas Industry and Efficient Fuel Service in the Home," by Mr. G. C. Holliday (Gas Light and Coke Company); the other on "Town Gas in Industry and Commerce," by Mr. A. Higgs (Yorkshire Industrial Gas Centre).

In the Home

Mr. **Holliday,** introducing his Paper, said: The discomfort in the home and dislocation of industry caused by last winter's fuel crisis have made everyone realize as never before how fundamentally important fuel is in our national life. While emphasis at present is on the production of sufficient coal to meet our minimum requirements, there is little doubt that the long-term question of efficient domestic fuel utilization ought to be reviewed with a sense of added urgency.

Detailed schemes for tens of thousands of permanent dwellings are under consideration all over the country. The fuels that can be used in these homes are being largely predetermined by the nature of the plans and the decisions of the Ministries and local authorities. The decision that some 120,000 temporary houses should not be provided with gas water heating facilities, similar restrictions on gas in many of the proposals for permanent dwellings and arbitrary decisions as to the numbers of people who shall be allowed to cook or heat water by gas or electricity, without reference either to the supply position or the effect on national coal consumption, may ultimately have a quite serious unbalancing effect on the whole fuel situation in this country.

Is it realized, for instance, that gas and coke at present supply some four to five times the amount of useful heat in the home as electricity, and that for cooking alone some nine million households use gas? Is it realized that if a million rehoused families, who previously used gas for cooking, are switched over to electricity, they will consume an additional 500,000 tons of the nation's coal each year, besides depriving the Gas Industry of part of its most important base load and the nation of valuable by-products; or that using gas for summer water heating consumes only one-third to one-half of the coal required by other methods?

Long Term Policy

I am personally in agreement with recent pronouncements that some attempt should be made immediately to lay down a more specific long-term national fuel policy, based not on competitive salesmanship but on sound technical evidence, so that Local Authorities can have proper guidance on fuel matters when deciding on the provision of equipment for the four million new homes we still have to build.

We cannot implement the Simon Committee's 20-year programme for a complete switch-over to domestic smokeless fuels unless full facilities for using gas in our new homes are provided now. Increased use of gas means increased production of coke. Without increased production of coke there is no hope of meeting the requirements for solid smokeless fuels.

I have attempted to summarize the main recommendations of the Simon and Egerton Committees, to review the progress that is being made in their realization and, in particular, to indicate the contribution that can be made by the Gas Industry in the provision of the improved standards of domestic heat services. Judicious combination of the two smokeless fuels, gas and coke, in which coke is used for the main winter water heating and space heating, and gas for the other heat services, not only gives the consumer a high degree of labour saving service at low cost and with minimum expenditure of national coal resources, but also gives the Gas Industry itself a good load factor.

I have described some of the modern coke and gas appliances suitable for domestic purposes. I have also referred briefly to the remarkable improvements in design and efficiencies of these appliances that are still taking place. In the 10 years or so just prior to the war, improvements had resulted in an overall 20% saving in gas consumption, *i.e.*, four therms could do the work previously requiring five therms. Research and development work, some as yet in the laboratory stage, has already shown the possibility of still further improvement in efficiencies and reduction in maintenance, installation and running costs. Examples are quoted of increased efficiencies obtained with modern coke appliances and gas fires, cooker grills, wash boilers and water heating systems, &c.

I have compared a typical domestic installation using gas and coke to give the new standard of heat service, with installations using other combinations of fuels, and shown that from the point of view of coal conservation when gas and coke are used, there is a saving of some 1¼ tons of coal per household per annum as compared with other fuels. Improvements in both gas utilization and gas manufacturing efficiencies will still further reduce the coal requirements.

I make no apologies for giving some illustrations of modern appliances since owing to the present restricted production there are still many people who are quite unfamiliar with these up-to-date designs. I hope the Paper will be of some practical value to local authorities and the many other people actively concerned with this difficult problem of new housing. It is impossible in a relatively short Paper to deal fully with all the matters referred to in a wide survey of this kind, but more detailed information can be obtained, if required, from the gas undertakings.

Discussion

Mr. **J. E. Davis** (South Metropolitan Gas Company) said the Paper was full of practical information capable of being translated by lay people directly into practical application without a great deal of conversion. Watson House was one of those places that dealt with ordinary complaints from ordinary people, some of which were extraordinarily difficult to solve, and the Author had rightly stressed the great responsibility resting on those who made decisions for others. If 1,000 tenants of 1,000 houses made their own choice some were bound to make mistakes, but generally one set of mistakes cancelled out another set. But if one person in deciding for them all made a mistake it was repeated 1,000 times, and Mr. Holliday's plea for a greater understanding of the problems involved in efficient domestic fuel utilization was therefore one that should receive careful consideration. Dealing with coal conservation he had given a simple calculation showing that the same amount of coal was required to produce 150 therms of gas as for 1,500 units of electricity; it was therefore obvious that if the equivalent work of one therm of gas was done by anything less than 10 units electricity was more economical than gas; anything more than 10 indicated the reverse.

On the question of the measurement of heat service, there came from Watson House 10 years ago an idea of defining "useful therms"—a very valuable idea provided performance in practice of one appliance could be compared with another, but figures recently produced aroused grave doubts as to whether comparisons were valid. A modern solid fuel appliance might produce 700 gall. of hot water per week, but not all the therms were "useful" if only 200 gall. were needed. Requirements of families in apparently similar circumstances varied very widely and it was not easy to determine whether or not a tenant could—or even wanted to—afford a certain standard of comfort. Many factors must, therefore, be considered before housing authorities reached decisions of far reaching consequence.

American Practice

Mr. **A. C. Pallot** (Ministry of Works) added his thanks to those of the previous speaker to Mr. Holliday for his Paper, which he described as the latest of a series emanating from Watson House, which had been of the greatest value to all dealing with housing in its various aspects. Mr. Holliday's Paper was so clear and logical that it was difficult to make any criticism, but Mr. Pallot thought that some of the information which he had recently obtained during a visit to the United States might be of interest. He had recently been a member of a mission investigating district heating in that country. American housing policy differs from our own in so far as utility services are concerned—gas, water, electricity, heating and hot water are included in the rental and meters are very rarely installed in the individual houses. The amounts used under these conditions give a very fair picture of the actual needs of the community.

As regards gas cooking, which was fairly general, the consumption was at the rate of about 100 therms per annum. In some cases, however, this was greatly exceeded, as the mission inspected one housing estate for coloured people who were dissatisfied with the temperature of 72° F. maintained by the district heating plant, and kept the gas cookers in their houses continually alight in order to raise the temperature. The result was a consumption of about 2½ times as much as that budgeted for, together with heavy condensation.

As regards the temperature levels regarded as necessary in America, it was interesting to find that these had progressively increased. A good deal of work on fundamental comfort was being carried out at the John B. Pierce Foundation at New Haven. About the year 1900 men's suits in America weighed about 11½ lb.; in 1920 they weighed 8½ lb.; and the present figure was about 6½ lb. In 1900 comfort was attained in the low 60's, but as the weight of clothing had diminished so the required temperature had been increased. The John B. Pierce Foundation had developed scales of "mets" (heat losses from the human body) and "clos" (clothing insulation values) which indicated that with

the present standards of clothing temperatures of 71° or 72° were necessary. Hot water consumption in these American housing schemes averaged about 50 Imperial gall. per day and it was not found that the consumption varied very much from month to month. In cases where tenants heated water by local means at their own cost the consumption was about 30 gall. per day. The liberal use of hot water on the housing estates certainly resulted in very high standards of cleanliness and the children in particular appeared to be very well cared for.

At Philadelphia it had been possible to make a comparison between district heating and gas. Several estates were district-heated by means of solid fuel boilers, consumption averaging about five tons per dwelling per annum, which was equivalent to a useful consumption of 740 therms per annum in space heating and hot water. For the estate served by gas the average consumption was 840 therms, so that, allowing 100 therms for cooking, the requirement for space heating and hot water was identical with that in the solid fuel scheme. The space heating in the estate served by gas was by means of a heat exchanger, in conjunction with a fan distributing hot air to various rooms of the house, thermostatically controlled from the living room. Hot water was provided in a separate heater, both gas appliances being flued through the roof. Mr. Pallot added that he was not advocating the adoption of American temperature standards in this country as many factors entered into comfort and the conditions which applied in the American climate might not be appropriate here.

Dr. **F. J. Eaton** (Gas Light and Coke Company) said that in the case of the convector open coke fire with back boiler there appeared at present to be a tendency to increase the size of the boiler to produce more hot water. If the resultant hot water were used for space heating as well as for the normal domestic requirements, the proportion of "useful therms" would be increased.

Mr. **Kilner,** Borough Engineer, Prestwich, criticized the Gas Industry's propaganda. The Industry had, he said, held on to gas lighting for years after people wanted it. It was no use ramming down the throat of the housewife that a particular appliance would use less coal than another. She did not care, and would continue to use what she preferred. Mr. Holliday had spoken of gas heated washing machines fitted with agitators and wringers which might be hand operated or electrically driven. Why not, he urged, be frank and call them electric washing machines heated by gas. One other grouse was the gas iron. If they could make an iron that would heat itself without a filthy tube hanging around it, well and good; if not, they had better drop it and leave the job to people who could provide something that was clean. Propaganda wanted livening up in the Industry as a whole.

Mr. **L. W. Andrew** (Gas Light and Coke Company) emphasized the importance of actual comfort as distinct from mere warmth, and claimed advantages for systems which enabled the occupants of a room to be at such distances from the heat source as to obtain the degree of comfort they desired. With all due respect to Mr. Pallot he believed that the Americans were realizing that there was more in comfort than in air temperature, and their research institutes had published various papers referring to the need for considering further the advantages of radiant heat.

Mr. Holliday Replies

Mr. **Holliday,** replying to the discussion, said that in a typical house mentioned in the Paper from 21 to 23 units of electricity would be needed to do the equivalent of one therm of gas, so that only half the amount of coal would be required if gas were used. "Useful therm" and electricity equivalents should be derived from practical usage tests, a great many of which had been done at Watson House. He agreed that the present standard of hot water usage in this country was still low, and for that reason he felt that still more efficient methods should be developed for getting hot water from the back boiler and from the water heating systems, some examples of which had been mentioned in the Paper.

In reply to Mr. Kilner he thought it was immaterial whether the power driven washing machine was described as a gas heated electric washing machine or an electrically driven gas washing machine. New types of flexless gas iron were being developed. The purpose of the Paper was not to persuade the housewife to buy particular appliances, but to assist local authorities to provide the type of installations which would make the least demands upon our coal resources. Mr. Pallot's references to American heating practice were most interesting, but at the same time he felt that great caution must be exercised in comparing American conditions with conditions in this country. American standards of heating and comfort were not necessarily ideal, and with regard to ventilation in particular some research workers in this country were alarmed at the present tendency to reduce the number of air changes in rooms, due mainly to the absence of flues.

In Industry and Commerce

Mr. **Higgs,** introducing his Paper on "Town Gas in Industry and Commerce," said: The fuel crisis indicated in no uncertain manner the importance of an adequate supply of fuel to the nation's economic recovery. Without these supplies in all forms, our productive capacity is seriously reduced, and the supply of even basically essential commodities rendered questionable. Prior to the crisis the gas and electricity services in this country had a proud record of virtually unbroken reliable service, which fact tended to accentuate the difficulties arising from the sudden restriction in supplies. Many types of industrial plant make use of both forms of energy, thus the failure of either automatically means the stoppage of the entire plant. Those plants operating entirely on gas were possibly a little more fortunate as in many cases a measure of production was still possible.

In addition to the increased use of gas for industrial and commercial purposes, domestic utilization has increased appreciably, particularly so for space heating. This is reflected in the unprecedented demands experienced during the crisis, possibly accounted for by the shortage and increased cost of solid fuel, coupled with the greater spending power of the average worker.

Our resources in easily accessible solid fuel are not unlimited, so that it behoves us to use our available assets as efficiently as possible. Eminent fuel technologists in the Gas Industry have long contended that the use of raw fuel was basically a wasteful method of using our limited resources; and at a conference as long ago as 1936, Mr. Dean Chandler, of the South Metropolitan Gas Company, said: "When cheap fuel fails, England will no longer be one of the greatest workshops of the civilised world, unless some as yet untapped source of cheap energy is discovered and made available for use in our factories and workshops."

From this point of view it can be said that in many applications it is more economical to carbonize the coal at the gas-works than to use it in the raw state. Further, although many industrial applications of electricity are themselves highly efficient, if the overall efficiency of current generation and utilization is considered, it will in many instances be apparent that carbonization offers advantages.

Unparalleled Increases

Unparalleled increases in gas used for industrial processes and commercial applications have been occasioned by the impetus of war, and a recent survey indicated that nearly 40% of the total sales of gas are used in these fields. The main consumption in industry is in connexion with the manufacture of steel which accounts for 4.5% of the total. Food manufacture, automobile, aircraft, general engineering, pottery and glass manufacture, briefly cover the other major applications, these being listed in the order of importance as regards degree of utilization. On the commercial side, the applications include steam raising, heating of swimming pools, bread baking, large-scale cooking, canteens and fish frying.

The advantages of cleanliness, simplicity, reliability, absence of ashes, smoke and dust, are factors that have influenced the selection of gaseous fuel; particularly so in applications where cleanliness is imperative as in the case of swimming pools, laundries, and central heating in municipal and other buildings.

The present industrial and commercial load is not altogether a result of greater industrial activity, but can be claimed in no small part as due to the Gas Industry's own efforts. In 1934 a chain of Industrial Gas Development Centres were formed, and through these Centres technical information is pooled and data is available on a multitude of varying applications. The Centres support the specialist services of personnel who have made a study of the application of gas to specific processes on the area of the undertakings to which they are attached. Thus the individual efforts of an Industrial Engineer or Centre are co-ordinated, and more efficient methods of utilization developed in any part of the country are quickly made available to the Industry as a whole. Research and development work is continually being carried out to increase the efficiency of gas-fired plant, and the local gas undertaking can be relied upon to furnish reliable data on any problem requiring heat.

The Paper described seven gas installations for heating large buildings and for steam raising, four installations for the heating of swimming pools, three air heating plants, two examples of heating of vehicle radiators, four typical industrial installations, and other miscellaneous applications, including grass and grain drying, and gas-fired crematoria.

Discussion

Mr. **H. R. Hems** (Birmingham) said the fact that the installations which Mr. Higgs had described existed and some of them had been working successfully for some time, and that he was able to select from many those which he felt would satisfy the particular interests of the Public Works Congress was a tribute to the popularity and efficiency of gas as an industrial

fuel. Gas development was represented by a very old Industry and was frequently just taken for granted, and therefore it had not the glamour or immediate popular appeal of its sister industry.

As to the importance of the necessity for a balance view of the use of coal, coke, gas, and electricity, he would call attention to a recent statement by Sir Ernest Smith, lately President of the Institute of Fuel and recently appointed Chairman of the Industrial Consumers' Council of the National Coal Board, who had asked the Government to consider the appointment of a National Fuel Board to work in conjunction with the National Coal Board and whatever other boards were adopted for the gas and electricity industries. He considered the proper use of our national fuel resources was so important that the proposed Fuel Board should have been the first step in the programme for the nationalization of the fuel industries.

It often came as a surprise to many to be informed of the vast number of applications to which gas was devoted, part from the gas cooker, water heater, and other uses in the home. To those within the Industry who were aware of the tremendous demands made on their resources during and since the war, the fact that gas was recognized so widely for industrial and commercial processes came as no surprise; they had been patiently putting over the advantages for many years. It was one thing for them to have known they had the ideal fuel; it was another to get industrialists and other potential users to recognize it, but figures of gas output during the war and to-day confirmed that gas was one of the most widely-sought fuels.

Birmingham's Industrial Load

The Author had referred to 40% of the total output of gas being used for industry. Birmingham at the peak of the war period, was sending out 46% of its gas for use in the factories. In 1946 the percentage fell to about 36% due to the falling off in the demand from the war factories, but in the year ended last March the figure had begun to rise on a greatly increased total load.

Domestically the completely understandable desire of the modern housewife to rid herself of the laborious work of the Victorian and Edwardian eras had led to the use of clean fuel by tap or switch for cooking, heating, and the provision of hot water in the home. Industrially, the improvement of working conditions in factories, the revolution in production methods, had also led the industrialist to seek clean fuel by tap or switch for the thousands of processes demanding heat in the factories, and in fairness he thought he was prepared to pay more for the therms provided the overall labour costs were reduced and the gas heated mechanized furnace could be applied.

The American Gas Industry was using the slogan "The trend is to gas" in its industrial advertising. In this country we had to "Thank goodness for gas"—as much as we could get. All records showed that the demand for gas in the factory confirmed a trend to gas in Great Britain. The Industry's greatest embarrassment at present was the fact that so many gas undertakings, owing to continuing unprecedented domestic and industrial demand, could not meet the new loads which were being asked for without risk of breakdown of already existing commitments until new plant was available and coal supplies were assured.

No doubt some of the present demand was due to the acute shortage of coal, and when that was alleviated a falling off in the enquiries might ensue, but he was convinced from his own experience with industrialists in the Midlands that greater strides would be made in the future with the application of gas to industrial processes. It might be argued that such a prediction was sound so far as the factory was concerned, but was it correct in regard to the processes to which Mr. Higgs had made particular reference—the heating of swimming pools, large garages, large-scale blocks of flats, and other buildings coming under the heading of commercial processes? The aim of architects, town planners, and those who had the welfare of the people before them should be cleanliness, ease of working and control, and therefore gas and electricity were bound to be considered in preference to solid fuel in future projects, and provided that could be applied efficiently to the work, they should be so applied. From the national point of view it was more than ever essential that the use of raw coal should only be tolerated where an outstanding case could be made out for its adoption.

Essentially Public Works

The installations to which Mr. Higgs had referred were complete. That was not the time or place to argue as to whether they might have been done in a better way; perhaps other speakers would give their reasons for not adopting gas if they had not done so, and thus provide them with food for thought and some compensation for the effort which Mr. Higgs had put forward. The heating scheme to which he had referred were definitely "public works"—the garages and particularly the method of radiator heating for 'buses affected transport; the gas applications in the great Yorkshire copper works with the other trade processes were industrial, and the adoption of gas on such a large scale amplified his contention that the industrial trend was to gas. A manufacturer did not adopt a fuel to the extent shown without some excellent reasons. He was not generally a philanthropist and would not be expected to have reasons similar to those of perhaps a more idealistic nature which might influence a public authority.

Cremation, the last process to which Mr. Higgs had referred, might be considered a public works job; a vital and necessary one if they were to reduce the use of hand for burial purposes, which was of little benefit to the nation. The selection of fuel was in that case vitally important from whatever angle the matter was viewed. The repeated selection of gas for new crematoria was a tribute to its silent and all-round efficient service in this last service to mankind.

Reference had been made to the national service the Gas Industry rendered through the British Gas Council. They only asked that whenever heat applications were required they should be given the opportunity to put the case for gas. They were realists and always tried to appreciate the other fellow's point of view, naturally putting up as strong a case for gas as they could. He congratulated Mr. Higgs on his Paper. He (Mr. Hems) had the privilege of presenting a similar Paper to the Congress in 1937, the preparation and reception of which he enjoyed and appreciated, and he felt sure Mr. Higgs would share his feelings.

Controllability

Mr. A. C. Jennings (Sheffield) said the Author was to be congratulated on putting forward examples of gas-fired installations which conformed to the best possible practice in fuel utilization. In almost all the examples put forward, stress was laid on the essential controllability of gas. Those who were constantly dealing with the application of town gas for industrial processes were apt to take for granted the fact that gas was a simple fuel. Having obtained a particular result it was generally possible to reproduce the same result with a fair amount of certainty, and this was only possible because they were dealing with fuel whose own characteristics did not materially vary.

Gas was a highly refined fuel supplied in conformity with Statutory Parliamentary Regulations as to heating value and purity. Generally speaking, particularly with the larger undertakings, variation in the specific gravity and sulphur content were constant within the areas supplied by the undertakings, though, of course, these values varied in different parts of the country depending upon the particular plant operated by each undertaking.

Having a fuel of this type the rate of heat input to a burner could be exactly controlled for they knew that given constant pressure the amount of heat being put into the burner would remain constant for any opening of the fuel control valve. Such accuracy could not be obtained with any other form of fuel.

Heat input was not the only criterion in industrial processes, but the very form of the flame produced often had a marked bearing on the process. With town gas the amount of air supplied for combustion could be regulated within fine limits and by controlling the mixing of the gas and the air the type of flame might be varied to suit particular requirements. The fact that ignition was stable in an open gas flame was a feature often taken for granted, but which could rarely be obtained with other forms of fuel.

Having controlled heat input and flame form, temperature regulation became a simple matter, but it was quite often a combination of these other two factors which controlled temperature. Another point in connexion with control of air gas ratio was that the atmosphere generated in a furnace chamber might be regulated to produce reducing neutral or oxydizing effects with certainty. One other point which should be stressed was the ease and certainty of ignition of gas as compared with other fuels, many of which relied on an incandescent combustion chamber to promote stable conditions of combustion.

Both Mr. Higgs and Mr. Holliday had made a point of the saving of coal and in view of the present National coal situation it might not come amiss to give some figures taken for heavy industry in Sheffield. Their records indicated that in general when gas was used for heating of steel, approximately one-third of the expenditure of heat is required as when coal was used. This statement could be substantiated by quoting three cases recently given to the Institute of Fuel by his predecessor, Dr. Fells.

A firm which heated stock billets for rolling into bars and strip had found that in using gas the average heat input to the furnace was 40 therms per ton of steel compared with 150 therms per ton using coal.

Another firm used 75 therms of gas per ton for heating high speed steel for forging compared with 230 therms per ton on coal, and a third firm found that they were able to do as much steel heating with 3½ million therms of gas as they previously did with 12 million therms of coal. Apart from the marked fuel conservation obtained was the relative saving in labour made possible by the absence of fuel and ash handling in each case. The life of the furnace equipment had also been prolonged so that a saving of labour in furnace maintenance and a consequent depreciation

on furnace idle time was also apparent. This saving in furnace bricks also made a valuable contribution to the overall national fuel saving.

Mr. **W. F. Howell** (Manchester) said the work at Birmingham on concentrated combustion and furnaceless heating, the process that had been made in infra red drying, and the permeable lined furnace designed by the Yorkshire Centre all represented advances in the thermal efficiency of industrial gas.

The President said it was a fact that there was a lack of fuel economy consciousness in this country, and although one might be criticized for emphasizing that aspect in discussions on domestic matters it became of supreme importance when discussions took place on the fuel demands to be met by each undertaking. Those connected with the Gas Industry in its industrial application would know that for many years he had resisted the use of gas for vitreous enamelling work, but to-day he was responsible for a growing consumption of gas for that process. He had no doubt that ultimately, if not in our lifetime, we should have a co-ordinated fuel policy in this country and the tendency would be to avoid the direct use of coal and to subject it to treatment prior to use. Those who were advocates of the merits of the Gas Industry's products felt that in the domestic sphere the Industry would have a much bigger load in the future than in the past. It would doubtless continue to meet with competition in certain spheres of application. Some aspects of competition in the past had led to the advocacy of other fuels for purposes for which they could be used, but for which they ought not to have been used, and in conceiving the fuel policy of the future it would be necessary to decide how the various fuels were to be used in the best interests of the nation.

Mr. **Higgs**, in a brief reply, said a co-ordinated fuel policy was long overdue. The use of raw fuel should not be permitted in view of the present shortage of coal. At a recent meeting of the Institution of Heating and Ventilating Engineers some figures were given which indicated that in industrial processes the fuel efficiency of electricity was only 12.5% against 28% for gas. The case for more efficient fuel utilization was being increasingly recognized, and it could only be hoped that a co-ordinated policy would be established in the near future.

On the proposition of Mr. **J. Terrace** (Hon. Secretary of the Institution of Gas Engineers), a vote of thanks was accorded to Dr. Hartley for presiding.

The Exhibition

Among an imposing array of stands we have selected the following as being of particular interest to the Gas Industry:

THE STAVELEY COAL AND IRON CO., LTD., OF CHESTERFIELD.—Sound spun, metal spun, and cast iron pipes and specials together with the Staveley flexible and "Baxter" patent pre-cast lead joints. Chemicals and by-products are also displayed.

G. A. HARVEY & CO., LTD., OF LONDON, S.E.7.—Perforated metals of every description; woven wire, sheet metal and steel platework of all kinds.

RAWLPLUG CO., LTD., LONDON, S.W.7.—Rawlplugs, Rawlbolts and anchors for fixing anything from a tooth brush rack to anchoring securely the heaviest machinery. Mechanical and electrical percussion hammers.

TURNER'S ASBESTOS CEMENT CO., LTD., MANCHESTER, 17.—"Everite" asbestos cement pressure pipes for gas and water mains; of particular interest is a range of pipes which have seen long service under varying conditions and which are still in excellent condition.

JAS. WALKER & CO., LTD., WOKING.—A full range of "Walker" and "Lion" packings and jointings into which many notable improvements have been introduced.

PERMUTIT CO., LTD., LONDON, W.4.—Water purification plant and filters together with an interesting model of a "Precipitator" softening plant, which shows the complete process of softening by lime.

NATIONAL CASH REGISTER CO., LTD., LONDON, N.W.1.—The National adding machine.

BROCKHOUSE HEATER CO., LTD., WEST BROMWICH.—Gas-fired steam boilers in sizes from 30,000 to 300,000 B.Th.U. per hour and "Selfstoke" gravity feed boilers.

Other exhibits of interest are those of AUTOMATIC TELEPHONE AND ELECTRIC CO., LTD., remote control sets; BRITISH ROAD TAR ASSOCIATION, information bureau concerning the use of tar for roads, etc.; EXPANDED METAL CO., LTD., expanded metal products for reinforcement, etc.; B. JOHNSON & SONS, LTD., "Benjo" power rammers and tamping machines; GRANT AND WEST, LTD., range of engineers' and builders' products; ALLAN TAYLOR (ENGINEERS), LTD., gas service vacuum and pressure cleaning outfit.

Work Has Begun on the Louth Gaslight Company's £50,000 scheme, which will ultimately develop into an entirely new and up-to-date gas-works, to be completed, it is hoped, in about five years. The new retort house, on which a start has been made, will have four beds of eight retorts and the existing retort house, pensioned off after 72 years, will become a coal store.

"GAS SERVICE"

Dealing as it always does with the sales and service side of the Gas Industry, the August issue of "GAS SERVICE" covers a wide range of activities in the fields of fitting, industrial and domestic utilization, maintenance, installation, and sales.

Purchase Tax

Despite the removal of tax on cookers and refrigerators and its reduction on washing machines, water heaters still bear the heavy burden of 66⅔%. Mr. Dalton has evidently not considered these appliances so essential to public health and service. The falsity of this supposition is apparent and the British Gas Council took immediate steps to enlighten Mr. Dalton. The resulting memorandum receives editorial comment, together with a summary of present public lighting restrictions.

Over There

Our American correspondent provides humour and shrewd, well-informed comments on the American scene. In Pennsylvania, the "heart of the soft coal industry," 90% of those applying for home building permits favour gas. As in this country, shortages of manufacturing equipment and piping tend to throw sand in the cogs of progress. The American Gas Association is to launch next month a million dollar promotional campaign to put over their theme that "The New Gas Ranges are Really New."

Exhibitions

The issue contains illustrated accounts of two important exhibitions. The first, an industrial show, was held by the Watford and St. Albans Gas Company and in addition to attracting many notabilities, was televised by the B.B.C. The second, the Hospitals (Domestic Aids) Exhibition, was held at the Regent Street Tea Centre and was sponsored by the British Electrical Development Association and the British Gas Council. Many types of gas equipment were exhibited, both for cooking and central heating.

Piston Manufacture

Twenty-five years ago Specialloid, Ltd., developed the manufacture of aluminium alloy pistons. Gas is extensively used in the ingot production department and it was this that drew a party from the Southern Association of Gas Engineers and Managers to inspect the works at Boreham Wood, Herts. We publish an account of how gas is employed in this factory, illustrated by photographs.

A Woman's Viewpoint

The principal subject dealt with this month is the outstanding success of a Home Management Course organized for the Women's Section of the British Legion by the Newcastle-upon-Tyne and Gateshead Gas Company. The potentialities of such courses in the interest of the furtherance of gas usage cannot be underestimated. The recent controversy over women's place in the gas showroom has, not unexpectedly, roused our contributor to pass judgment, and since that judgment is based on much experience, it is worthy of keen attention.

Thus Saith the Fitter

Among the Salesmen's Circle Papers is one written from an unusual angle—that of the fitter. G. S. Miller is Senior Fitter to the Bury St. Edmunds Gas Company and this Paper, presented in June to the Eastern Counties Circle (Eastern District), will provide food for thought, particularly his comments on consumers' supposed preference for electrical apparatus.

College Kitchens

The subject of college kitchens is rather unusual since their operation differs in certain respects from ordinary hotel and restaurant work. It would be difficult to find a better example of a college kitchen than that of King's College, Cambridge, and the words of H. R. Stanley, Sales Supervisor to the Cambridge University and Town Gas Light Company, who recently equipped this kitchen with gas apparatus, must therefore be taken as being authoritative.

Looking Ahead

The first part of the Paper under this title, by J. W. B. Hyde, presented to the Home Counties (Western Area) Circle, appeared in the July issue of "GAS SERVICE." The Paper is concluded in the current issue. Mr. Hyde is critical, but he uses his criticism constructively. Instantaneous and storage water heaters, cookers, and fires all receive a searching examination and features found wanting are revealed with a refreshing bluntness.

Changed Conditions

Mary Northfield has been with the Ipswich Gas Light Company for over 20 years and her opinion is therefore one to be sought with confidence. As Home Service Advisor she has watched the drastic change in selling conditions occasioned by the war and has formed some interesting conclusions.

Circles' News

The issue contains a full report of the Home Counties (Western District) Circle visit to the Gothic Works of R. & A. Main, Ltd., and an illustrated page describing the Research and Development Division of De La Rue Gas Development, Ltd., at Boreham Wood.

BRADDOCK'S MAIN TAPS

No. 390 and No. 391

Main Cocks screwed female each end

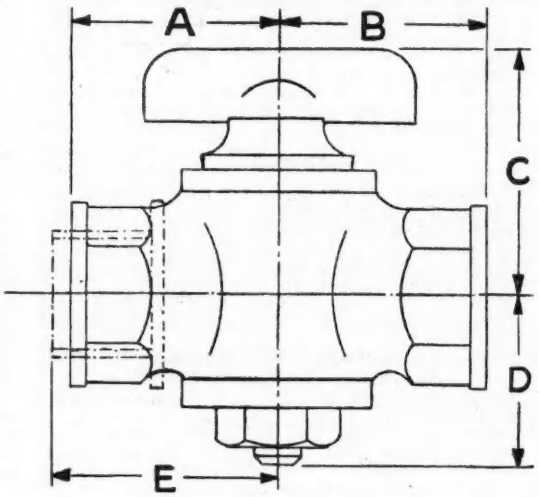
All our taps are tested to withstand 50 lb. per inch pressure.

No. 390 (T.P.)
No. 391 (K.P.)

No. 392 and No. 393

Main Tap with one end screwed female, the other end screwed male

No. 392 (T.P.)
No. 393 (K.P.)



The metal of the taps is a superior quality gun metal.

Sizes T.P. ... $\frac{1}{2}$" to $1\frac{1}{4}$"
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$\frac{3}{4}$"	$1\frac{1}{2}$"	$1\frac{1}{2}$"	2"	$1\frac{1}{4}$"	$1\frac{5}{8}$"
1"	$1\frac{13}{16}$"	$1\frac{13}{16}$"	$2\frac{1}{4}$"	$1\frac{5}{8}$"	2"
$1\frac{1}{4}$"	$2\frac{1}{4}$"	$2\frac{1}{4}$"	$3\frac{1}{2}$"	$2\frac{1}{4}$"	$2\frac{1}{2}$"
$1\frac{1}{2}$"	$2\frac{3}{4}$"	$2\frac{3}{4}$"	$3\frac{3}{4}$"	$2\frac{7}{16}$"	3"

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THE GAS INDUSTRY IN GERMANY 1945-1947*

RESTORATION AND CONTROL IN THE BRITISH ZONE

By H. D. GREENWOOD, M.Sc.

(*Continued from p. 254*)

FROM the ovens then in operation some 200,000 cu.m. a day were being supplied direct to seven towns and to four industrial consumers. The total supply to the Ruhrgas A-G. was approximately 100,000 cu.m. a day compared with their normal supply of 10 million cu.m. a day. The four other grid systems were out of action. It might well be said that the whole of the grid gas system had collapsed.

The grid system of Western Germany consists essentially of a main pipe-line of 800 mm. running roughly in an east-west direction from Dortmund to Duisburg and interconnecting the main concentrations of cokeries in the Ruhr area. To this main line are connected distribution pipe-lines, three of which run roughly north and south. The most westerly follows the course of the Rhine from Duisburg to Coblence; the middle line from Castrop-Rauxel, north-east of Bochum, runs south across the Ruhr to join the west line at Cologne; while the South Westphalia line runs from Dortmund through Siegen to Frankfort, south of which there is a connexion to the grid system of the Saar. A fourth line runs east from Dortmund through the Hamm area where a further group of cokeries is connected into it, and continues to Hanover, where it joins the main line of the Reichswerke Company, running to Berlin *via* Brunswick and Magdeburg.

Throughout the system, telephone and electric-indicator cables follow the routes of the pipe-lines and enable the central controls in Essen and Hamborn to maintain contact with the cokeries and the major consumers.

The cokeries may be roughly divided into two classes; cokeries at collieries, which supplied most of the surplus gas either into the grid system or to towns and local industry, and cokeries which formed part of integrated metallurgical or heavy chemical works and which, though they frequently delivered surplus gas into the grid, were at times consumers of gas from it.

The latter included the steel works of the Thyssen group, Gutehoffnungshütte at Oberhausen, Bochumer Verein, and smaller groups, as well as the large new Hermann Göring (Reichwerke) Steelworks near Brunswick, and the eight synthetic ammonia and oil plants in the central Ruhr area. Though these integrated plants represented a large proportion of the coking capacity they were not of the same importance in the grid system, with the exception of the Thyssen group, which had been planned, by very complete integration of steelworks with the cokeries and power stations, to yield a large proportion of surplus gas for distribution to towns and industry.

Repair of Grid System

On the entry of gas officers into Germany in July, 1945, a rapid survey of the position was carried out which showed certain sections of the system to be partly workable and a number of coke oven plants in a position to supply gas. Sections of the system which were partly workable were separated from each other by serious damages such as broken bridges, and constituted a number of separate and unconnected areas of supply.

The position may be summarized as follows:

(*a*) The Left Rhine pipe-line was not badly damaged in the north and was working from two coke oven plants, Friedrich Heinrich and Rheinpreussen.

(*b*) The West line from Duisburg was workable southwards as far as Cologne and could be served by the Thyssen cokeries at Hamborn. It was not, however, working, because of lack of coal at the cokeries. This area had been heavily shelled during April.

(*c*) The Hanover line from Hamm to the Weser Bridge at Bad Oeynhausen was in operation, a little gas being obtained from one coke oven plant.

(*d*) The Hanover line east of the Weser was working from cokeries Barsinghausen and Georgschacht to Hanover.

(*e*) Some local supplies were possible from individual coke oven plants.

Grid companies in the Ruhr were already engaged on repair work where possible. They were now instructed to concentrate on repairs needed to

(*a*) extend the working portions noted above and to start the supply to other lines—*e.g.*, South-west line;

(*b*) connect up additional coke oven plants, particularly those heated with producer gas and thereby giving a higher gas yield per ton than some already working;

(*c*) connect up the working sections in order to balance the load.

In the meantime accurate maps were prepared of the complete grid system. Each company operated more or less independently and there were no composite maps available of the complete system even in the official Government records, which were then in our hands.

The main collecting line between the Emscher and Rhine-Herne canals had been rendered useless by the destruction of the bridges over which all connexions to and from the line had been taken. In addition, there was serious damage to the pipe-lines in Hamm, Essen, Bochum, Dortmund, and Remscheid areas. The full extent was not known, but there were at least 720 breaks. Subsequent work showed many further breaks.

While the district groups of the grid gas companies proceeded with the repairs of the distribution lines outwards from the Ruhr, other gangs aided by contractors were employed in the Ruhr itself to implement (*b*) and (*c*) above.

In spite of considerable difficulties in the supply of labour, transport, acetylene, &c., by early 1946 more than 90% of the high-pressure system was at work, but it was not until August, 1946, that the main line between the canals was repaired and connected by means of pipe-bridges so that gas could be passed in either direction to balance the system, and the connexion between Dortmund and Hamm was not completed until October, 1946. Up to this time supply and demand had to be balanced separately in each of the various distribution lines, but completion of repairs now enabled gas to be moved more or less as it was needed, independent of the point of production.

After the occupation it was found that storage holders were practically all destroyed or damaged. Of 54 M.A.N. holders in the Ruhr with a total capacity of 3.92 million cu.m., 23 were completely destroyed and none was workable, but there are now nine working with a capacity of 381,000 cu.m. The largest holders useful to the grid supply with a total capacity of about 2.25 million cu.m. were more than 50% destroyed, and the remainder so damaged as to require very extensive repairs. Most of these holders were in operation throughout the war and there is no record of any explosions arising from war damage.

Restoration of Production at Cokeries

By the end of 1946, coke oven gas supply was about 30% of the 1943 consumption.

The progress of mains repairs and of repairs to coke oven plants was always ahead of the availability of coal for carbonization, and hence demand for gas has been consistently ahead of supply. In order to obtain the maximum yield per ton of coal it was necessary to utilize those cokeries with facilities for underfiring with producer or blast-furnace gas to the maximum extent and to close down the most inefficient plants. By early September, 1945, the position was sufficiently clear to enable a review to be made, and North German Coal Control, in consultation with the Gas Control, arranged a programme of concentration of production. At this time there was a stock of more than 3 million tons of coke in the Ruhr, and the controlling factor was the demand for gas. Coke oven plants for operation were selected according to their position relative to workable parts of the grid and to the yield of surplus gas. The number of cokeries working was, therefore, reduced from 41 to 29, and producer-gas generators were repaired and brought into operation wherever possible. No exact figures are available for the earlier months but in September, 1945, the gas sold to towns and industry averaged only about 130 cu.m. per ton of coal. By December, 1945, this had been increased to 180 cu.m., and reduction of consumption at mines and cokeries, combined with further progress in utilization of blast-

* From Communication No. 316 of the Institution of Gas Engineers.

furnace and producer gas, had raised this figure to 192 cu.m. by December, 1946. At this time there were 46 coke oven plants in operation.

In addition to increasing the yield per ton of coal it was recognized that a very close control of the distribution of coke oven gas was essential to ensure that the limited supplies available were used for those purposes that would help to restore the German economy in accordance with Military Government policy.

Control of Gas Production

As stated previously, central control of the Industry has been exercised from the Zonal Headquarters, acting through the Gas Officers at the five Regional Headquarters, this being based on allocation of coal and raw and manufactured materials, and permits for repair and extension of plant, labour, &c.

In order to implement these controls, routine reports on production and consumption were required from all gas undertakings and grid gas companies, these being summarized with comments, at the headquarters of each region and forwarded to the Zonal Headquarters. These returns, which were made monthly, give full details of production and consumption, rationing, labour, denazification, &c., and from them a monthly report is compiled and submitted to Headquarters in Berlin.

Allocation of Materials and Labour

The allocation of coal and all other materials, whether basic or manufactured, is strictly controlled.

Each of the five regions has submitted quarterly statements of its requirements, which were consolidated at headquarters for consideration by the appropriate allocation committee. Planning of industrial production and allocation of materials has also been based on quarterly periods, but almost everything is in very short supply, and only a proportion of the estimated requirements could be met from current production. Stocks held by works at the end of the war have in most cases now been used; it has, therefore, been necessary to concentrate on the most urgent repairs, and central control has been essential to ensure the most efficient distribution of materials.

(*i*) *Coal*

Coal supply has throughout been the most difficult problem. Coal output did not rise as anticipated, and for the first 18 months coal has been in desperately short supply. Coal allocations were made initially on a monthly basis, but latterly this has been changed to three-monthly periods. The total allocation of coal was subdivided at Headquarters for the five Regions, where it was further broken down into the requirements of the individual works. These requirements are forwarded to the North German Coal Control, which is responsible for distribution and delivery to the consumer.

Allocations did not meet the initial requirements based on 50% of previous consumption, and as the industrial demand grew and the accurate estimates of the gas required to meet the domestic ration became available, larger allocations were required. Allocations have not exceeded 80% of the demand, and it has not been possible to meet either the domestic ration or the industrial load. Further, coal allocations have frequently been too optimistic, with the result that deliveries have in some periods been only 60 to 70% of the allocation. In addition, distribution to individual works has been most erratic, some works receiving two or three times their requirements and others only a fraction of what they needed. Under these conditions, carefully made plans for production and the building up of stocks at works were often rendered useless, and it has necessitated a constant vigil to maintain works in operation. During the past winter transport has, of course, been difficult, but all works were kept in operation.

Coal quality, as might be expected, has been poor and irregular, and it is estimated that the gas yield is about 10% below the figure normally obtained. This is partly due to high ash content, but more often to the supply of low-volatile coal; figures of volatile content as low as 18% have been recorded. In the early days it was not unusual to have gas coal delivered to a power station and boiler slack to a gas-works, but as conditions improved these anomalies have gradually disappeared.

(*ii*) *Materials for Repairs, &c.*

The allocation of raw materials has been essentially on a consumer basis—*i.e.*, the materials have been allocated to each producing firm by the controlling branch. For example, the Gas Section has an allocation of steel for issue to individual gas undertakings which in turn re-issue it to contracting firms. In addition, other branches controlling firms manufacturing plant for the Gas Industry have had a bulk allocation of steel, part of which has been earmarked for gas. This system has had the advantage that it allows the Gas Section to keep a close control on work being carried out by gas-works and grid companies and to direct materials to the most useful purpose on a zonal rather than a regional basis. All proposals for repairs and renewal of plant are submitted to the Regional Headquarters, which in turn submits to Zonal Headquarters all those which require more than five tons of steel or silica, or of which the cost exceeds 10,000 Reichsmark.

Repairs to works and mains have been restricted by the inadequate supply of materials. Not infrequently, raw and manufactured materials were required which were not available in the British Zone and had to be obtained from one of the other zones. If they were in short supply it was very difficult and sometimes impossible to procure them. The following figures give an indication of the availability of certain basic materials at the present time:

Material	Requirement (Tons per quarter)	Allocation (Tons per quarter)
Steel	19,500	3,500
Cast iron...	25,000	4,000
	(Cu.m. per quarter)	(Cu.m. per quarter)
Timber	40,000	1,000

While the supply of fireclay refractories has been adequate, silica refractories are still the most serious problem. The best silica comes from the French Zone, that mined in the British Zone being slightly inferior in quality; usually the two qualities are mixed in suitable proportions. The output of the French Zone is much below normal and the proportion of this which is allocated to the British Zone is totally inadequate to meet the requirements of the consuming industries. Consequently, maintenance and repair of gas and coke oven plants, irrespective of the requirements of steel works and other consumers of refractories, is seriously handicapped. Maintenance was reduced to a minimum during the war, and many plants were destroyed or damaged. As a result many works are now in a precarious position which will deteriorate rapidly unless there is a considerable improvement in the supply of silica refractories.

(*iii*) *Labour*

Labour supply for gas production has not been a serious problem in view of the low level of production. There has been a shortage of skilled men and foremen, while many engineers have been dismissed under the denazification laws.

Much of the work of repairs of mains and services is carried out by unskilled labour, and of this there has always been a grave shortage in the Ruhr area. The demands for this labour for repairs of sewage and water systems, electric cables, &c., is very heavy, and the progress of gas repairs has been limited almost entirely by availability of labour. For example, it was estimated that some 3,000 men would be required for two years to repair the mains and services in Münster; up to the present about 300 have been available.

Labour also presents a problem to plant manufacturers—*e.g.*, refractory manufacturers are having to adjust their designs to utilize machine-made shapes wherever that may be possible, more particularly to eliminate heavy moulded pieces which require not only skilled men to make them, but strong-men to handle them. On the present food ration the men are physically incapable of such work.

Re-Establishment of German Administration

The German organization prior to the collapse of the Third Reich, has been described. Evacuation of Government departments from Berlin had resulted in almost a complete breakdown of any organized control. Many senior gas officials who had been ardent Nazis had disappeared, and works were left in the hands of junior staff without direction or guidance. The activities of German associations were suspended and the holding of meetings forbidden at that time, and there were no official representatives of the Industry with whom the conditions could be discussed or through whom instructions could be transmitted to individual undertakings.

The office of the Inspector General for Water and Power had been evacuated from Berlin early in 1945; some of the staff and records had been hidden in Saxony, and others in South Germany. Those in Saxony were discovered in June, 1945, and brought to Frankfort-on-the-Main, together with a number of the former officials of the Ministry.

After considerable difficulty, suitable officials were appointed to control gas production and supply in each Region and were given authority to obtain all information required by Military Government and to transmit orders to individual undertakings.

In August, 1946, a German Economic Advisory Board was established at Minden. The function of this Board was to act as the representative of German Industry and to be responsible for transmitting instructions from the Control Commission to Industry and for supplying economic and technical information. The Board was

divided into sections corresponding to the branches of the Control Commission. The German Gas Section was organized on similar lines to its British counterpart and consisted of a chief official with five assistants, responsible for production, distribution, grid gas supplies, law and finance, raw materials, gas appliances, &c., respectively.

Detailed work such as preparation of monthly reports, was gradually passed over to the German organization, but they were given no executive powers until Jan. 1, 1947. From this date onwards, the above organization was merged into a joint economic Administration for the combined U.S.-British Zone, and at the same time was given full executive powers over the industries it represented.

The German regional gas officials, formerly responsible to the British regional officials, were now directly responsible to the German organization at Minden. The officials originally appointed were, in some cases, loaned and paid by gas undertakings, and it now became necessary to appoint full-time officials who would be civil servants under Regional Economic Ministries. This was again a matter of difficulty in view of the inadequate salaries paid by the Regional Administrations.

The securing of suitably qualified officials, the clearance of these officials by the various denazification panels, and the arrangement for their employment at suitable salaries with the zonal and regional German administrations has been no simple task. It must be appreciated that the normal channels for advertising, &c., were not available, and it was only by personal contact that it was possible to find suitable men. Not infrequently they were resident in other Zones, and long and complicated negotiations were required before their services could be secured.

It is perhaps appropriate at this stage to record that from the very early days full co-operation has been obtained from these German officials of all grades, and the Author has no record of any disciplinary action having been necessary. The outlook of a public utilities officer is the same whether he be English or German, and the common objective in the re-establishment of public utilities services has greatly helped the Control Officer in his work.

Before leaving the subject of German administration, mention must be made of the problem of denazification, regarding which there has been so much controversy concerning both its wisdom and practicability.

The process of denazification is intended to implement Allied Control policy for ensuring that all traces of Nazism and militarism are removed from the German people. The magnitude of this task and its repercussions on German economic life need no elaboration.

As is already well known, under the Nazi régime scarcely any individual of standing in public or semi-public life could retain his position unless he was at least a nominal member of the Nazi party. This affected not only Government officials, but executives in the business and industrial spheres, so that with very few exceptions, men holding senior appointments in the Gas Industry had to have some association with the Nazi party, if only on paper.

To-day, every German before retaining or accepting new employment in any grade above that of ordinary labour, must have been screened by a German Denazification Panel consisting of proven anti-Nazis. After submitting a completed form of questionnaire ("Fragebogen") to the Panel and calling such witnesses as he may wish, the individual is placed in one of five categories according to the findings of the Panel. The categories are designated to cover all possible types of Nazi and militarist, from war criminals in category 1 to those in category 5, who are cleared or exonerated. The recommendations of the German panel are passed to the Public Safety Branch of Military Government for approval.

This, broadly, has been the procedure adopted in the British Zone and has applied to all personnel above and including the foreman grade. It has necessitated the removal of many able and experienced men, while those allowed to remain (who are often of inferior calibre) have had to shoulder the burden of several men's jobs. Much time has been expended in searching for men who are technically qualified and politically clear.

The Position at the End of 1946

The position at the end of 1946 is summarized in Table 6, and is compared with production and consumption in 1935 and 1943, the former being the last year for which official statistics are available. Many official documents and records were destroyed by bombing, and it has been difficult to collect reliable information for the war years.

TABLE 6.—*Gas Production and Supply from Gas Undertakings (British Zone).*

	1935	1943	End of 1946*
Number of towns supplied with gas ...	—	373	349
Coal carbonized in gas-works (thous. tons)	1,356	1,952	1,122
Gas distributed by gas undertakings (million cu.m.)—			
(*a*) ex gas-works	509	777	552
(*b*) ex coke ovens	559	1,248	630
	1,068	2,025	1,182
Average calorific value (kcal. per cu.m.) ...	4,300	4,300	4,000
Blue water gas made (million cu.m.) ...	70	90	104
Per cent. of total gas distributed by gas undertakings	6.6	4.4	8.8
Coke made for sale (% of coal)	49	50	32
Tar made (% of coal)	4.2	3.4	3.1

* Figures for 1946 are calculated from the rate of production at the end of 1946 and the beginning of 1947.

It will be noted that the town Gas Industry has been restored to about the 1935 level, which is approximately half of that in 1943. At the present time, as in 1935, coke oven gas comprises about half of the town gas distributed. Coke oven gas supply to towns is now determined mainly by the gas rationing system, but some towns in the heavily damaged Ruhr area are not yet able to take the full ration. There are only 24 towns without supply. Practically all towns now have a 24-hour supply, although in some towns the pressure is considerably reduced during certain hours.

The domestic consumption and the effect of rationing is shown by the following figures which represent the result of a recent survey:

TABLE 7.—*Domestic Gas Consumption*

	1935	1943	1946
Population (million)	—	20.3	22.8
Domestic consumers (million)	2.16	2.5 (est.)	2.87*
Total domestic consumption (million cu.m. per annum)	575	1,145	590
Calorific value (kcal. per cu.m.)	4,300	4,300	4,000
Consumption per consumer (cu.m. per annum)—			
(*a*) Actual consumption	270	458	190†
(*b*) Estimated consumption to meet domestic ration	—	—	280†

* In 1935 and 1943 the figures relate to the number of meters, and in 1946 to the number of registered households.
† Corrected to a calorific value of 4,300 kcal. per cu.m.

About 70% of the gas required to meet the domestic ration is now being supplied. If the full ration could be given to all consumers, the consumption per consumer would be equal to that in 1935. The figures are not quite comparable, since the 1935 figures relate to metered consumers, whereas the 1946 figures are for registered households, many of which have no separate meters; if meters were available, the majority of these consumers would have their own meter. The figures suggest that the domestic ration is perhaps too high, but it must be appreciated that many consumers in 1935 took less than the present ration. At present, due to the absence of any other form of cooking (consumers are not allowed to use *both* electricity and gas for the same purpose), there is a tendency for consumers to use all the gas they can get. It is estimated that the 2.87 million registered households consuming gas are equivalent to about 9 million persons out of a total population of 22.8 million in the Zone.

TABLE 8.—*Town Gas Consumption (million cu.m. per annum)*

	1935	%	1943	%	1946	%
Domestic	575	53.7	1,230	60	590	49.5
Industrial	301	28.1	692	34.2	380	32.2
Street lighting ...	135	12.5	0	0.0	3	0.3
Used on works ...	57	5.7	103	5.8	16	1.4
Lost					193	16.3
	1,068	100	2,025	100	1,182	100

(To be continued.)

Last Week Mr. Leslie Hardern, Public Relations Officer, Gas Light and Coke Company, delivered a very interesting lunch-time lecture at the Suffolk Street Housing Centre, called "How London Housewives do their Washing." Mr. Hardern gave statistics drawn up after a recent survey made for the Gas Light and Coke Company by Research Services, Ltd., showing the different methods adopted by London housewives in dealing with the difficult problem of the week's laundry —what percentage of this was sent to the laundry and what done at home, how many housewives had drying cabinets and how many were forced to depend on weather conditions, and what demand there was for the communal wash-house with modern washing and drying equipment. One very interesting fact was that no group of housewives, even those of the highest income level, send all their washing to laundries now; all did a certain amount in the home, whether or not they had good drying facilities.

GAS STOCKS AND SHARES

New low levels were reached in almost every section of the stock market last week, due mainly to the economic situation. Heavy falls in British funds were followed by an increased eagerness to sell in the industrial market, the total number of dealings being considerably higher than in recent weeks. Reluctance to buy, however, depressed prices, but towards the end of the week the drop in prices attracted some increased buying. The *Financial Times* industrial Ordinary share index fell to 119.5, which was 4.9 lower than the level reached in the February fuel crisis.

Dealings in gas stocks were somewhat less numerous than of late, but prices throughout showed a downward tendency. Price changes, all indicating decreases, recorded during the week were as follows:

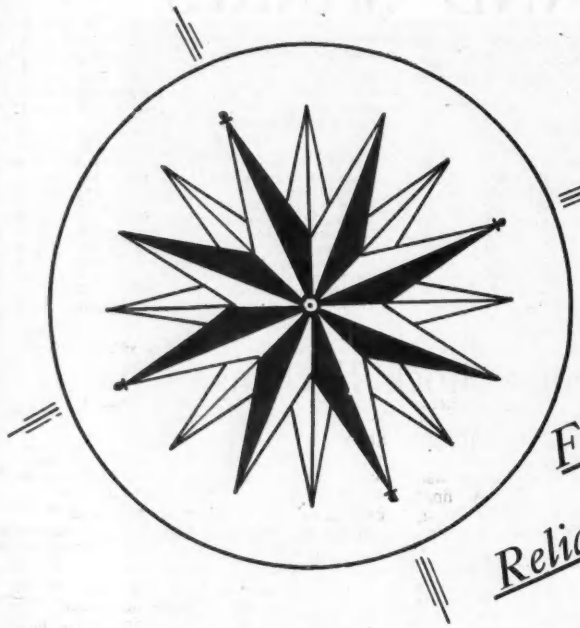
OFFICIAL LIST

Assoc. G. & W., 4½ p.c. red. cum. pref.	19/–	— 21/–	— 6d.
Barnet, ord. 7 p.c. max.	155	—160	— 3
Bath, cons. ord. 5 p.c. basic	105	—110	— 2
Bournemouth, 7 p.c. max. div.	155	—160	— 3
Brighton, &c., 5 p.c. perp. deb.	118	—123	— 1
Bristol, gen. cap. 5 p.c. max.	107	—112	— 3
Brit. Gas Light, 4 p.c. red. deb.	95	—100	— 1
Cardiff, cons. ord. (xd. July 16)	120	—125	— 1
Cheltenham 5 p.c.	103	—108	— 2
Commercial, 3 p.c. deb. perp.	87	— 92	— 4
Croydon, sliding scale	117	—122	— 1
East Surrey, 5 p.c. irred. deb.	118	—123	— 2
Gas Light and Coke, ord.	22/–	— 23/–	— 9d.
Imperial Continental, cap.	112	—117	— 6
Liverpool 5 p.c. ord.	115	—120	— 2
Mid. S. Utility, "A" cons	97	—102	— 3
Montevideo, Ltd., ord.	127	—132	— 1
Newcastle & Gateshead, 3½ p.c. perp. deb.	99	—100	— 1
Newport (Mon.) 5 p.c. perp. deb.	117	—122	— 2
Primitiva Holdings, Ltd., ord.	9/6	—11/6	— 6d.
Reading, 4 p.c. perp. deb.	97	—102	— 1
Sheffield, cons.	137	—142	— 2
South Metropolitan ord.	93	— 98	— 2
South Suburban, ord. 5 p c.	107	—112	— 3
Southampton, ord.	103	—108	— 1
Tottenham, ord.	107	—112	— 3
U.K. Gas Corp. 3½ p.c. red. deb.	98	—103	— 2
Uxbridge, 5 p.c. perp. deb.	118	—123	— 2
Wandsworth, cons.	107	—112	— 3
Watford & St. Albans, ord.	107	—112	— 3

Quotations on the London Stock Exchange

When ex-Dividend	Dividends Interest.% Last Yr.	Prev. Yr.	NAME.	Quotations July 31
Mar. 12	4	3½	Alliance & Dublin Cons. Ord.	21/6—23/6
April 30	5	5	Assocd. Gas & Water U'd'tgs Ord.	19/6—21/6
"	6	6	Do. Deferred	20/—22/–
Mar. " 12	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	20/—22/–
"	4	4	Do. 4 p.c. Red. Cum. Pref.	19/—21/–
"	4	4	Do. 4 p.c. Irred. Cum. Pref.	19/—21/–
Feb. 26	7	7	Barnet Ord. 7 p.c. max.	155—160
Mar 12	5	5	Bath Cons. Ord .5 p.c. basic	105—110
Nov. 18	...	10	Bombay, Ltd., Stock	50/—52/–
Jan. 29	8½	8½	Bournemouth Std. 5 p.c. sliding scale	173—178
"	7	7	Do. 7 p.c. max. div.	155—160
"	4	4	Do. 4 p.c. Pref.	98—103
"	6	6	Do. 6 p.c. Pref.	127—132
Feb. " 12	...	3½	Do. 3½ p.c. Red. Deb.	90— 95
June 4	4	4	Do. Perp. 4 p.c. Deb.	98—103
Feb. 26	5·35	5·55	Brighton, &c., 5 p.c. Std. Cons.	105—110
"	6·3	5½	Do. 6 p.c. Std. Cons.	115—120
June " 4	5	5	Do. 5 p.c. Perp. Deb.	118—123
Feb. 26	5	5	Bristol, Gen. Cap. 5 p.c. max.	107—112
June 4	...	4	Do. 4 p.c. New Deb. Red.	98—103
Mar. 12	7½	7½	Brit. Gas Light Ord.	117—122
June 18	...	5½	Do. 5½ p.c. 'B' Cum. Pref.	109—114
June 4	4	4	Do. 4 p.c. Red. Deb.	95—100
Feb. 12	10	10	Cambridge U. & T. Orig. 10 p.c. Cons.	190—200
"	5	5	Do. 5 p.c. Cons. 'C'	100—105
"	7	7	Do. 7 p.c. Cons. 'B.'	135—140
April 30	...	4½	Cape Town, Ltd., 4½ p.c. Cu. Pf.	17/—19/–
July 16	—	6½	Cardiff Con. Ord.	120—125xd
Mar. 12	5	5	Cheltenham, 5 p.c. basic Cons. Ord.	103—108
June 18	4	4	Do. 4 p.c. Perp. Deb.	98—103
Feb. 12	5¾	5¾	Chester United Ord.	120—125
June 18	7	9½	Colombo Ltd., Ord.	39/6—41/6
"	7	7	Do. 7 p.c. Pref.	23/6—25/6
Mar. " 26	...	5	Colonial Gas Assn. Ltd. Ord.	17/—19/–
"	8	8	Do. 8 p.c. Pref.	22/6—24/6
Feb. " 12	5	2	Commercial Ord.	85— 90
June 4	...	3	Do. 3 p.c. Deb. Perp.	87— 92
Feb. 12	...	5	Do. 5 p.c. Irred. Deb.	118—123
"	6	6	Croydon sliding scale	117—122
"	5	5	D max. div.	100—105
"	...	4	Do. 4 p.c. Irred. Pref.	97—102
June " 18	4	4	Do. 4 p.c. Perp. Deb.	98—103
"	5	5	Do. 5 p.c. Perp. Deb.	118—123
Feb. " 12	8½	7½	Derby Cons. Ord.	140—150
June 18	4	4	Do. 4 p.c. Red. Deb.	99—104
Feb. 12	5	5	East Hull Ord.	97—102
"	5	5	East Surrey 'B,' 5 p.c.	100—105
"	6	6	Do. 6 p.c. Cum. Pref.	120—125
June " 18	5	5	Do. 5 p.c. Irred. Deb.	118—123
Feb. 26	6¾	6¾	East Wight Cons. Ord.	110—120
Mar. 12	5	5	Eastbourne 'A'	95—100
"	3½	3½	Do. 'B'	90—100
Nov. 18	...	5	Gas Consolidation Ord. 'A'	20 —22/–
"	...	5	Do. Ord. 'B'	20/—22/–
May " 14	...	4	Do. 4 p.c. Red. Cum. Pref.	19/6—21/6
Feb. 12	...	5	Gas Light & Coke Ord.	22/—23/–
"	3½	3½	Do. 3½ p.c. max.	80— 85
"	4	4	Do. 4 p.c. Con. Pref.	97—102
July " 2	3¾	3¾	Do. 3¾ p.c. Red. Pref.	95—100
June 4	3	3	Do. 3 p.c. Con. Deb.	87— 92
"	5	5	Do. 5 p.c. Deb.	100—105
"	4½	4½	Do. 4½ p.c. Red. Deb.	102—107
"	...	3½	Do. 3½ p.c. Red. Deb.	98—102
Mar. 26	...	5	Gloucester Cons. Ord.	103—108
Mar. 12	5	Nil	Great Yarmouth (8½ p.c. max)	10 — 12½
Feb. 12	2	8¾	Guildford Cons. Ord.	135—140
Feb. 26	7½	5	Hampton C't, 5 p.c. Cons. Ord.	103—108
Feb. 26	5	4½	Hartlepool G. & W. 5 p.c. Ord.	100—105
"	5	5	Hastings & St. L. (5 p.c. Std.)	87— 92
June " 4	6	3½	Do. (3½ p.c. Std.)	83— 88
"	5	6	Holyhead & N. Wales Ord.	22/—24/–
June 18	7½	3½	Hornsey 3½ p.c. Std.	95—100
April 16	5	5½	Do. 5 p.c. Std.	120—125
"	6 7/10	8	Imperial Continental Cap.	112—117
May 14	8½	3½	Do. 3½ p.c. Red. Deb.	97—102xd
July 16	—	7¾	Lea Bridge Co., Cons. Ord.	146—151
April 16	7¾	5½	Liverpool 5 p.c. Ord.	115—120
Feb. 12	5½	8½	Luton Cons. Ord. 'A'	128—138
Mar. 12	7¾	6½	Do. Ord. 'B'	110—115
"	6½			

When ex-Dividend	Dividends Interest.% Last Yr.	Pref. Yr.	NAME.	Quotations July 31
July 16	7	7	Malta & Med'n., 7 p.c. 1st Pref.	100—110xd
"	...	7½	Do. 7½ p.c. 2nd. Pref.	105—115xd
Feb. " 12	5·225	5·225	M.S. Utility 'A' Cons.	97—102
"	3·722	3·722	Do. 'B' Cons.	70— 75
"	5	5	Do. 'C' Cons.	98—103
"	...	4	Do. 4 p.c. Cons. Pref.	97—102
April 30	4	4	Montevideo, Ltd. Ord.	127—132
Feb. 12	5½	5½	Newcastle and Gateshead Ord.	24/6—25/6
July 2	3½	3½	Do. 3½ p.c. Perp. Deb.	95—100
Mar. 12	7	6	Newport (Mon.) Cons.	112—117
June 18	5	5	Do. 5 p.c. Perp. Deb.	117—122
April 30	6¾	6¾	North Middlesex 6 p.c.	130—135
"	5	5	Do. 5 p.c. Pref.	103—108
Feb. " 12	...	5	Northampton Cons.	104—109
Jan. 29	10	10	Oxford, Cons. Ord.	180—200
June 18	5¾	5¾	Plymouth & Stone Ord.	103—108
"	8½	8½	Do. Addl.	14½—16½
"	7¾	7¾	Do. New	14— 16
Mar. " 12	...	5	Do. 5 p.c. Deb. Perp.	117—122
Feb. 12	7½	7½	Portsmouth & Gosport Cons.	140—145
"	5	5	Do. 5 p.c. max.	100—105
"	10	10	Preston 'A'	170—190
"	7	7	Do. 'B'	132—137
June 24 46	2	4	Primitiva Holdings, Ltd. Ord.	9/6—11/6
June 4	...	6	Do. 6½p.c. Red. Cum. Pref.	100—105
Feb. 12	5	5	Reading, 5 p.c. max.	100—105
June 18	4	4	Do. 4 p.c. Perp. Deb.	97—102
"	...	...	Do. 3¾ p.c. Red. (Non-Cum.) Pref.	101—104
Feb. 12	5	5½	Romford, Ord.	105—110
Mar. 26	...	4	Do. 4 p.c. Debs. Red.	97—102
June 18	7½	5½	Severn Val. Ltd. Ord.	21/6—23/6
Feb. 26	...	4½	Do. 4½ p.c. Cum. Pref.	20/—22/–
"	6½	6½	Sheffield Cons.	137—142
July 16	4	4	Do. 4 p.c. Red. Deb.	98—103xd
June 4	6	5	South East'n Gas Ltd. Ord.	20/—22/–
Feb. 26	4½	4½	Do. 4½ p.c. Red. Cum. Pref.	20/—22/–
"	4	4	Do. 4 p.c. Irred. Cum. Pref.	19/—21/
Feb. " 12	5	4	South Metropolitan Ord.	93 — 98
"	...	6	Do. 6 p.c. Irred. Pref.	120 —125
"	...	4	Do. 4 p.c. Irred. Pref.	97 —102
June " 18	3	3	Do. 3 p.c. Perp. Deb.	87 — 92
July 16	5	5	Do. 5 p.c. Red. Deb.	97 —102xd
Jan. 29	5	5	South Suburban Ord. 5 p.c.	107 —112
"	...	5	Do. 5 p.c. Perp. Pref.	103 —108
"	...	4	Do. 4 p.c. Perp. Pref.	97 —102
"	...	3¾	Do. 3¾ p.c. Red. Pref.	92 — 97
June 4	5	5	Do. 5 p.c. Perp. Deb.	118 —123
April 30	5½	5½	South West. G. & W. Ltd. Ord.	19/—21/–
Feb. 12	5	5	Southampton Ord.	103 —108
Jan. 29	6	6	Sunderland Ord.	115 —120
Feb. 12	4½	3½	Swansea Ord.	83 — 88
"	...	5½	Do. 5½ p.c. Red. Pref.	100 —105
Mar. " 12	7	6 11/16	Swindon Cons. Ord.	115 —120
"	5	5	Tottenham Ord.	107 —112
"	5	5	Do. 5 p.c. Pref.	104 —109
"	5½	5½	Do. 5½ p.c. Irred. Pref.	116 —121
June 4	4	4	Do. 4 p.c. Perp. Deb.	98 —103
"	7½	7½	Tunbridge Wells, 4 p.c. Sliding	125 —130
"	7	6	U. Kingdom Ltd. Ord.	22/6—24/6
May " 14	...	4½	Do. 4½ p.c. 1st Cum. Pref.	20/—22/–
"	...	4	Do. 4 p.c. 1st Red. Cum. Pref.	19/6—21/6
June 18	4½	4½	Do. 4½ p.c. 2nd Non. Cum. Pf.	19/6—21/6
Mar. 12	...	3½	Do. 3½ p.c. Red. Deb.	98 —103
May 14	6¾	6¾	Uxbridge, &c., 5 p.c. Cap.	127 —132
"	5	5	Do. 5 p.c. Pref.	105 —110
June 4	5	5	Do. 5 p.c. Perp. Deb.	118 —123
Feb. 12	5	5	Wandsworth Cons.	107 —112
"	...	4	Do. 4 p.c. Pref.	97 —102
June " 18	5	5	Do. 5 p.c. Irred. Deb.	120 —125
"	4	4	Do. 4 p.c. Irred. Deb.	98 —103
Feb. 12	5	5	Watford & St. Albans Ord.	107 —112
"	...	5	Do. 5 p.c. Pref.	108 —113
"	...	5½	Do. 5½ p.c. Pref.	115 —120
"	5	5	Weymouth Ord. (5 p.c. Basic)	97 —102
"	11	11	Woking District "A" Ord.	190 —200
"	7·7	7·7	Do. "B" Ord.	133 —138
"	8	8	Wolverhampton Cons. Ord.	125 —130
Mar. 26	5	5	York Cons. Ord.	105 —110



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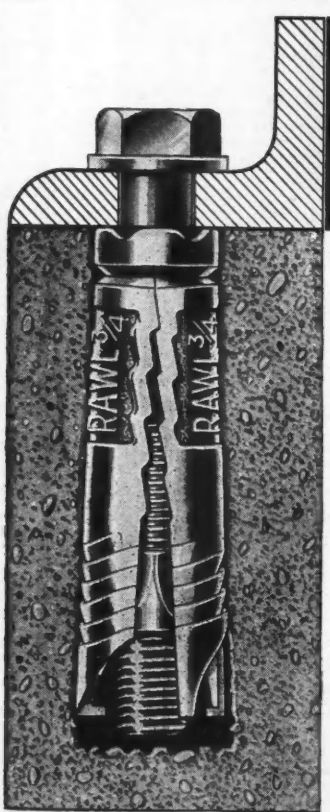

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GAS UNDERTAKINGS' RESULTS

Romford Gas Company.—The Directors have declared an interim dividend on Ordinary stock of 2½% actual, less tax, on account of the year to Dec. 31, 1947, payable on Sept. 1.

Newcastle-upon-Tyne and Gateshead Gas Company.—Interim dividends have been declared at the rate of 2½% on Ordinary stock and 2% on Preference stock (both the same as last year), payable on Aug. 9.

South Metropolitan Gas Company.—The Directors have declared an interim dividend of 2½% actual, less tax, on the Ordinary stock for the six months ended June 30, compared with 2% for the corresponding half of 1946. Warrants will be posted on Sept. 9.

Tottenham and District Gas Company.—Interim dividends at usual rates have been declared on the 5% and 5¼% Preference stock, and at the rate of 2½% on Ordinary stock, all less tax, on account of the year to Dec. 31, 1947, payable on Aug. 16.

Gas Light and Coke Company.—The Directors have declared dividends for the half-year to June 30 at the usual rates on the 4% Consolidated Preference, 3¾% Redeemable Preference, and 3½% Maximum stocks, and at the rate of 5% per annum (2½% actual) on the Ordinary stock.

Commercial Gas Company.—The Directors have declared dividends as follows: On the 4% Redeemable Preference stock, 1960-63, a dividend for the half-year to June 30 at 4% per annum, less tax, payable Sept. 1; on the Ordinary stock an interim dividend on account of the year ending Dec. 31, 1947, of 2½%, less tax, payable Sept. 1.

Lochgelly Gas Company.—Presiding at the 62nd annual meeting, Mr. Alex. Westwater, J.P., said that gas sales had reached nearly 72,000,000 cu.ft.—10% more than last year and double that of 1939. In the latter year coal cost 20s. 3d. per ton; to-day it costs 39s. 6d. per ton. Stokers' wages had increased during the war from 9s. 6d. to 18s. 2d. per shift. During the year the plant had been improved and added to and new main pipes laid to the new housing areas. Balance of profit and loss for the year after depreciation was £1,295 which with the carry forward from last year gave a total of £2,062. A dividend of 6%, less tax, was declared.

Ilkeston Gas Department.—The financial results of the year ended Mar. 31 show a net profit of £2,559, and the gross profit shows an increase of £2,268 over the previous year. An increased consumption of 24,241,000 cu.ft. brought the total output up to 294 million cu.ft., a record for the Department, and the income from gas sales was £5,406 more than in the previous year. The cost of coal was £3,097 more, but the revenue from coke brought in an extra £2,346, while the total income was £87,728, compared with £79,000 for the year 1945-46. Sales of appliances were satisfactory under difficult conditions, the total showroom sales being £15,231, equivalent to £1 13s. per consumer. All appliances were sold for cash, there being no hire purchase or simple hire. The basic price for gas is 11d. per therm, no increase having been made since 1940.

Montrose Gas Company.—A carburetted water plant installed last year saved about 1,700 tons of coal, it was reported at the annual meeting. Gas manufactured amounted to over 101,000,000 cu.ft., an increase on the previous year. Mr. W. A. Donald, Chairman, said the cost of manufacture had risen from 1s. to 1s. 2d. per 1,000 cu.ft., but despite this there was no gas company of a similar size who could better their selling price. Referring to nationalization, he said the company was in an excellent position, and whoever took it over would get an asset much in excess of what the shareholders would receive. The accounts showed a profit of £6,267, to which was added £2,023 from last year. A final dividend of 1s. per share, making 2s. in all, was declared, plus a bonus of 1s. per share.

Stourbridge Gas Department.—Gas sales during the year ended Mar. 31 increased by 89,292,985 cu.ft., equal to 14½%. Receipts on revenue account from all sources increased by £18,361 and expenditure by £29,983, the revenue profit being £18,777 against £30,299 in the previous year. Sinking fund, interest, and taxation charges, and capital expenditure not included in borrowing powers reduced the net surplus for the year to £1,974. During the year 4½ miles of mains were laid, mostly on housing sites. The quantity and quality of coal supplied deteriorated very badly during the severe March quarter, causing a considerable reduction in the make of gas per ton of coal used. The plant was strained to satisfy the demand. The increased production of water gas resulted throughout the winter in an acute shortage of coke for sale, and although the Department purchased all coke which the Ministry of Fuel and Power was willing to permit, it was not possible for all consumers to have their full requirements. German prisoners were employed during the year owing to the shortage of labour.

Stretford and District Gas Board.—In his report for the year ended Mar. 31, Mr. J. Grayston, Engineer, General Manager, and Clerk, records an increase of 9.1% in gas sales, compared with a decrease of 2.2% reported last year. For the first time in the history of the undertaking more than 10 million therms were sold in the year. A return to peacetime industrial activity made good the decreases experienced in industrial sales for the two preceding years, and the progressive increase in domestic sales continued. Consumers numbered 34,694, an increase of 450. Domestic sales increased by 13.14%, but industrial sales were still about one million therms below the maximum wartime consumption. The value of appliances sold amounted to £37,547, against £17,577 for the previous year. The balance carried to appropriation account was £5,363 against £4,893. The year 1947 marks the 25th anniversary of the formation of the Board. When it came into being in 1922 the amount of gas sold was 500 million cu.ft. per day; to-day it is more than four times that quantity, and industrial sales have increased more than ten-fold, while the number of consumers has risen from 14,000 to 34,694. Referring to the severe winter, Mr. Grayston records that it was never found necessary to reduce the supply to consumers excepting so far as was requested by the Ministry of Fuel and Power. The undertaking's prestige has never stood higher. "This public appreciation is going to stand us in good stead in future years when consumers will remember with gratitude the reliability of their town gas supply and will be encouraged to make further use of our services."

GAS PRODUCTS PRICES

The London Market

August 2

There are no changes to report in the prices of coal tar products.

The Provinces

August 2

Average prices for gas-works products this week are: Pitch, 75s. per ton; toluole, naked, North, 90's, 2s. 4d. to 2s. 6¾d. per gall.; pure, 3s. 2½d. Prices for carbolic acid 60's anthracene, creosote oil (hydrogenation), coal tar oils (timber preservation, &c.) and strained anthracene oil are controlled by Government Orders. Prices for road tar are increased by one penny per gall. by S. R. & O. 1947, 177.

Scotland

August 2

Throughput is well maintained despite the holidays.

Refined tar.* Yield to the distiller is 6d. per gall. ex works, naked. Creosote oil. Timber preserving quality,* 5½d. to 6½d. per gall.; hydrogenation oil,* 5¾d. per gall.; low gravity or virgin oil,† 7½d. to 7¾d. per gall.; benzol absorbing oil, 6½d. to 8d. per gall. Refined cresylic acid is 3s. 6d. to 4s. 6d. per gall. ex works, naked, according to quality. Crude naphtha,† 7d. to 8d. per gall. Solvent naphtha.* Basic maximum prices delivered in bulk, 90/160 grade 2s. 10d. per gall, and 90/190 heavy naphtha, unrectified 2s. 0½d. per gall, rectified 2s. 4d. gall. Pyridine,† 90/160 grade 15s. per gall., and 90/140 grade 17s. per gall.

* Price controlled. † Uncontrolled.

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